OWNER'S OPERATING MANUAL

REFLECTION

CL-410

DLP™ Projector

RUNCO

THE WORLD'S FINEST HOME THEATER PRODUCTS™

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TWO YEAR LIMITED WARRANTY

For Projectors, Video Processors and Controllers

Congratulations on your purchase of a Runco video product and welcome to the Runco family! We believe Runco produces "The World's Finest Home Theater Products". With proper installation, setup and care, you should enjoy many years of unparalleled video performance.

This is a LIMITED WARRANTY as defined in the Magnuson-Moss Warranty Act. Please read it carefully and retain it with your other important documents.

WHAT IS COVERED UNDER THE TERMS OF THIS LIMITED WARRANTY:

SERVICE LABOR: Runco will pay for service labor by a Runco Authorized Service Center when needed as a result of manufacturing defect for a period of two (2) years from the effective date of delivery to the end user (excluding the lamp).

PARTS: (Not including the lamp) Runco will provide new or rebuilt replacement parts for the parts that fail due to defects in materials or workmanship for a period of two (2) years from the effective date of delivery to the end user. Such replacement parts are then subsequently warranted for the remaining portion (if any) of the original warranty period.

PROJECTOR LAMP: Runco will pay for service labor by a Runco Authorized Service Center when needed as a result of a manufacturing defect for a period of six (6) months or 1000 hours, which ever comes first, from the effective date of delivery to the end user. In addition, Runco will provide a new or rebuilt replacement lamp for the lamp that fails due to defects in materials or workmanship for a period of six (6) months or 1000 hours, which ever comes first, from the effective date of delivery to the end user. Such replacement lamps are then subsequently warranted for the remaining portion (if any) of the original warranty period.

WHAT IS NOT COVERED UNDER THE TERMS OF THIS LIMITED WARRANTY:

This Limited Warranty only covers failure due to defects in materials and workmanship that occur during normal use and does not cover normal maintenance. This Limited Warranty does not cover cabinets or any appearance items; failure resulting from accident, misuse, abuse, neglect, mishandling, misapplication, faulty or improper installation or setup adjustments; improper maintenance, alteration, improper use of any input signal; damage due to lightning or power line surges, spikes and brownouts; damage that occurs during shipping or transit; or damage that is attributed to acts of God. In the case of remote control units, damage resulting from leaking, old, damaged or improper batteries is also excluded from coverage under this Limited Warranty.

CAUTION: THIS LIMITED WARRANTY ONLY COVERS RUNCO PRODUCTS PURCHASED FROM RUNCO AUTHORIZED DEALERS. ALL OTHER PRODUCTS ARE SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS LIMITED WARRANTY. MOREOVER, DAMAGE RESULTING DIRECTLY OR INDIRECTLY FROM IMPROPER INSTALLATION OR SETUP IS SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS LIMITED WARRANTY.

RIGHTS, LIMITS AND EXCLUSIONS:

Runco limits its obligations under any implied warranties under state laws to a period not to exceed the warranty period. There are no express warranties. Runco also excludes any obligation on its part for incidental or consequential damages related to the failure of this product to function properly. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. So the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

EFFECTIVE WARRANTY DATE:

This warranty begins on the effective date of delivery to the end user. For your convenience, keep the original bill of sale as evidence of the purchase date.

IMPORTANT: WARRANTY REGISTRATION:

Please fill out and mail your warranty registration card. It is imperative that Runco knows how to reach you promptly if we should discover a safety problem or product update for which you must be notified.

CONTACT A RUNCO AUTHORIZED SERVICE CENTER TO OBTAIN SERVICE:

Repairs made under the terms of this Limited Warranty covering your Runco video product will be performed at the location of the product, during usual working hours, providing location of product is within normal operating distance from a Runco Authorized Service Center. In some instances it may be necessary for the product to be returned to the Runco factory for repairs. If, solely in Runco's judgment, location of product to be repaired is beyond normal operating distance of the closest Runco Authorized Service Center, or the repair requires the unit be returned to the Runco factory, it is the owner's responsibility to arrange for shipment of the product for repair. These arrangements must be made through the selling Runco Dealer. If this is not possible, contact Runco directly for a Return Authorization number and shipping instructions. Runco will return product transportation prepaid in the United States, unless no product defect is discovered. In that instance, shipping costs will be the responsibility of the owner.

ADDITIONAL INFORMATION:
To locate the name and address of the nearest Runco Authorized Service Center, or for additional information about this Limited Warranty, please call or write:

RUNCO INTERNATIONAL, INC.
Attn: Customer Service Department
2900 Faber Street
Union City, CA 94587
Ph: (510) 324-7777
Fax: (510) 324-9300
Toll Free: (800) 23-RUNCO

RUNCO VIDEO PRODUCT INFORMATION

RETAIN THIS INFORMATION FOR YOUR RECORDS

Model Purchased _____ **Date** _____

Serial Number _____

Runco Authorized Dealer Name _____

Address _____

City _____ **State/Province** _____ **Postal Code** _____

Phone _____ **Fax** _____

Preface

ABOUT THIS MANUAL

This manual is designed for use with the CL-410 Projector. Information in this document has been carefully checked for accuracy; however, no guarantee is given to the correctness of the contents. The information in this document is subject to change without notice.

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FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warnings

WARNING! To meet FCC requirements, a shielded power cord is required in order to prevent interference. It is essential that only the supplied power cord is to be used. Use only shielded cables to connect I/O devices to this equipment. You are cautioned that changes or modifications not approved by the party responsible for compliance could void your authority to operate the equipment.

WARNING! The projector cooling fan continues to run for approximately 90 seconds after the projector is turned off using the Power button on the control panel or remote control. Never unplug the power cable to power off the projector; damage to the lamp may result.

WARNING! High brightness light source. Do not stare into the beam of light, or view directly. Be especially careful and ensure that children do not stare directly into the beam of light.

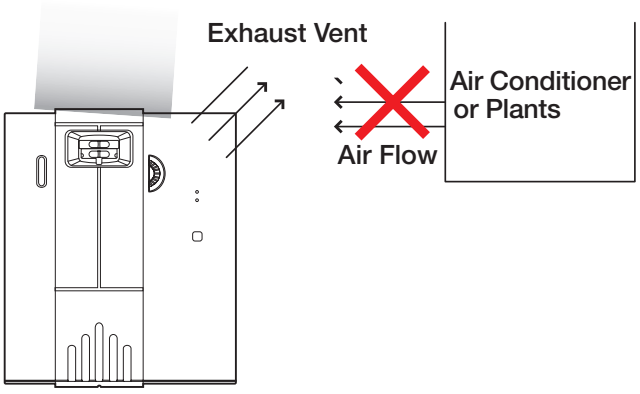
WARNING! To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

CAUTION! For minimal servicing and to maintain high image quality, we recommend that you use the projector in an environment that is smoke and dust free. When used in areas where there is a lot of smoke or dust, the filter and lens should be cleaned often to lengthen the service life of the projector.

WARNING! Some IC chips in this product include confidential and/or trade secret property belonging to Texas Instruments. Therefore you may not copy, modify, adapt, translate, distribute, reverse engineer, reverse assemble or decompile the contents thereof.

WARNING! The ventilation slots, lamp, and objects next to them may get hot during operation. Do not touch these areas until they have sufficiently cooled down.

CAUTION! Do not put the exhaust vent near air conditioners or plants.



Product Disposal

This projector utilizes a tin-lead solder, UHP Lamp containing a small amount of mercury. Disposal of these materials may be regulated due to environmental considerations.

Introduction

With the Reflection CL-410, Runco brings its famous video performance to a new level of affordability, putting Runco quality within reach of many aspiring home theater aficionados.

By combining a highly efficient optical light engine with broad installation and integration options, the CL-410 establishes the perfect balance between performance and affordability.

Runco has implemented a host of advancements into the projector's light engine to take full advantage of its widescreen, high definition DMD™ chip. The CL-410 features Enhanced GEN 3™ technology to produce deeper blacks, greater contrast ratio and brightness, and richly saturated colors. Among the CL-410's features are a sophisticated color-balancing system that results in the industry's best gray scale tracking, and far surpasses the capabilities of CRT projectors. Accurate gray scale reproduction is vital to vibrant, true-to-life color reproduction, as well as superior black level and white level performance. Runco's acclaimed Vivix™ video processing and scaling assure pristine video imagery, while the CL-410's generous light output capability is powerful enough to handle screens as large as 96 inches wide with ease.

The CL-410 features a 16:9 aspect ratio resolution of 1024 x 576, and provides a DVI input for pure digital video signal transmission. In addition, the projector's broad lens shift capability, variable throw distance, and electronic horizontal and vertical keystone correction allow for flexible placement within virtually any theater environment. Also featured is discrete IR control making it simple to partner the CL-410 with other audio/video components and automated control systems for a truly high-end, home theater system.

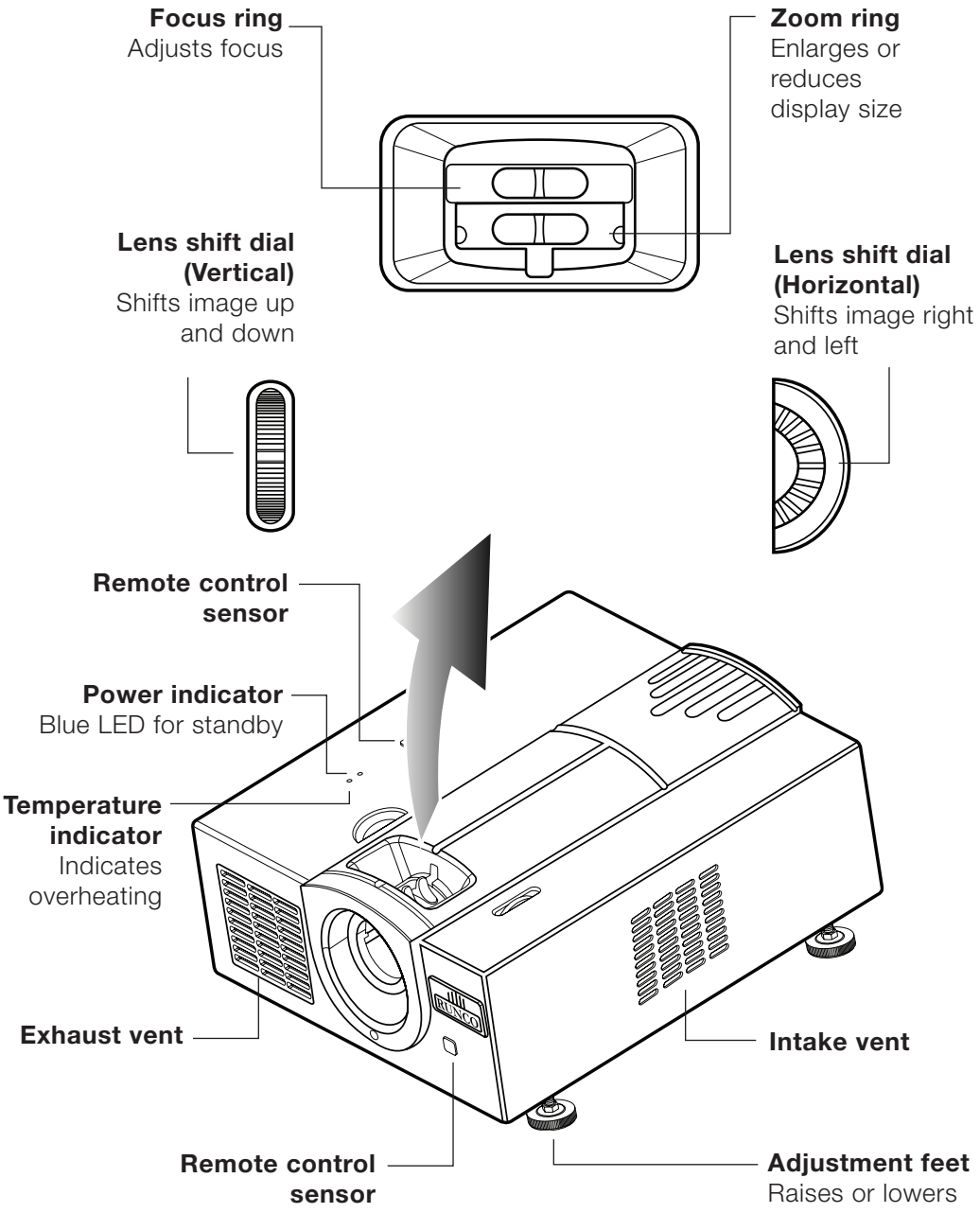
Package Contents

The following listed items are shipped with your projector.
Ensure you have received all these items before using your CL-410 projector.

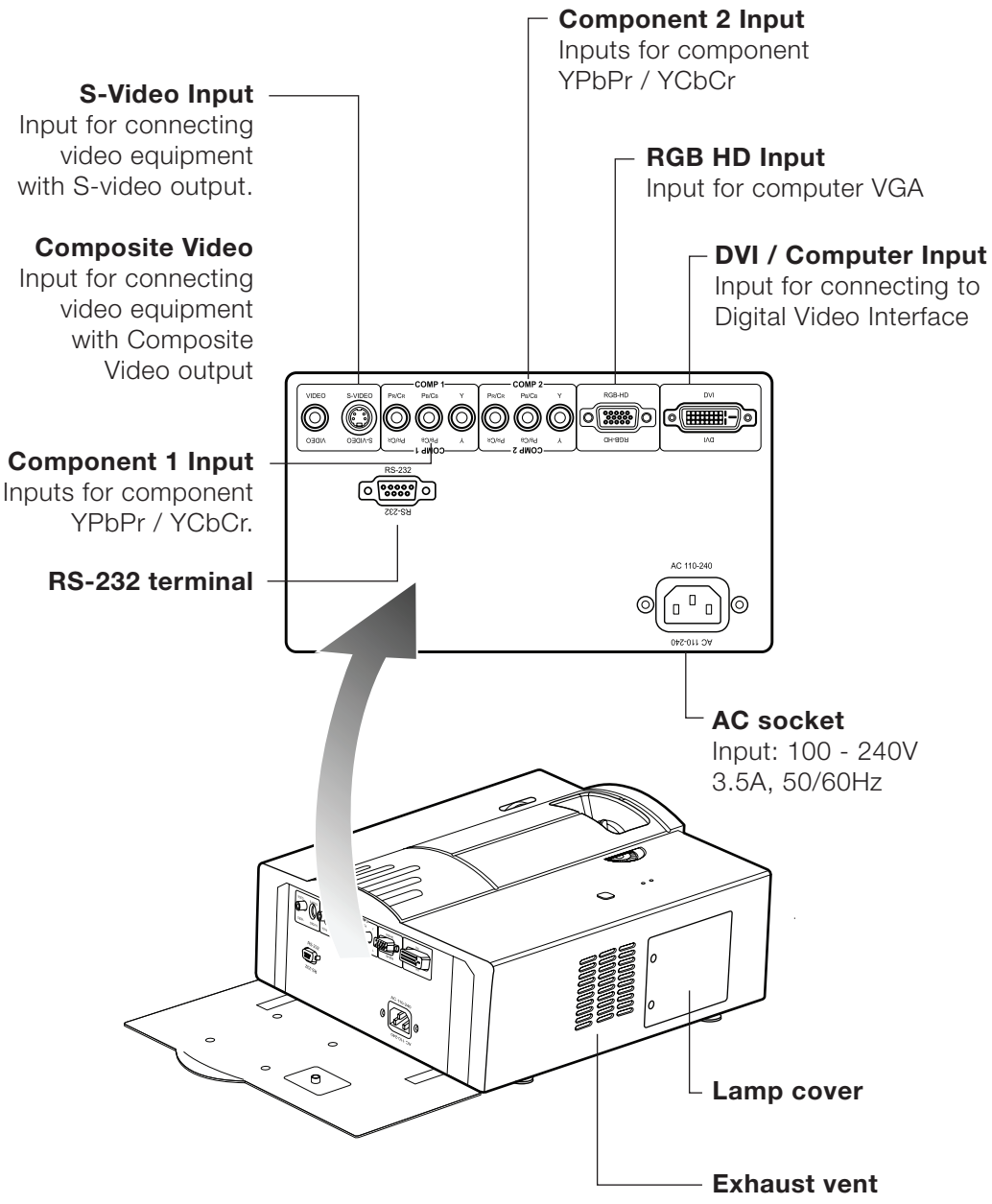
- User's Manual
- Remote Control (includes two AAA batteries)
- Power cord
- HD 15-pin VGA to HD 15-pin VGA cable
- DVI-D to DVI-D cable
- Warranty Card

Optional Accessories: Ceiling Mount

Projector (Front and Top View)

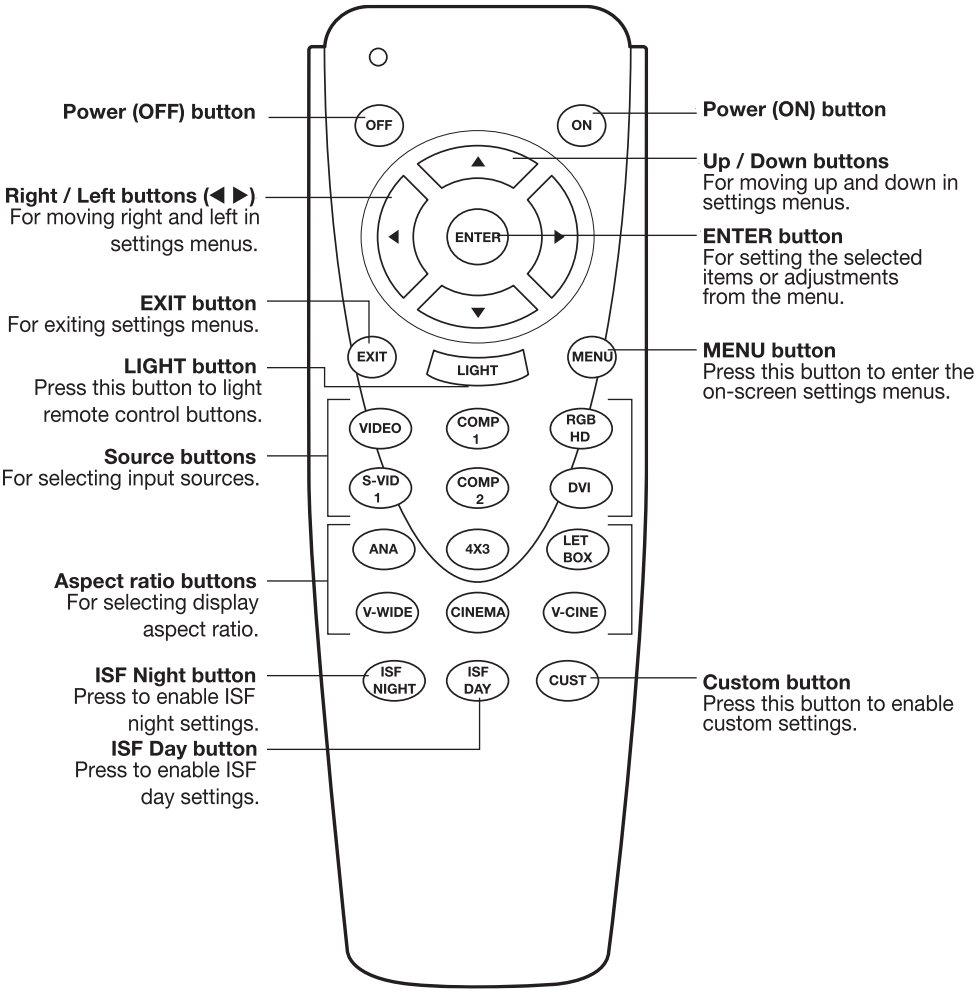


Projector
(Rear and Side View)



WARNING! As the projector lamp becomes extremely hot, air blowing out from the ventilation slots can also be uncomfortably hot.

Remote Control



Source Buttons					
VIDEO	Press this button to select Composite video source.	COMP 1	Press this button to select Component 1 source.	RGB HD	Press this button to select RGB HD source.
S-VID 1	Press this button to select LS-Video 1 source.	COMP 2	Press this button to select Component 2 source.	DVI	Press this button to select DVI source.

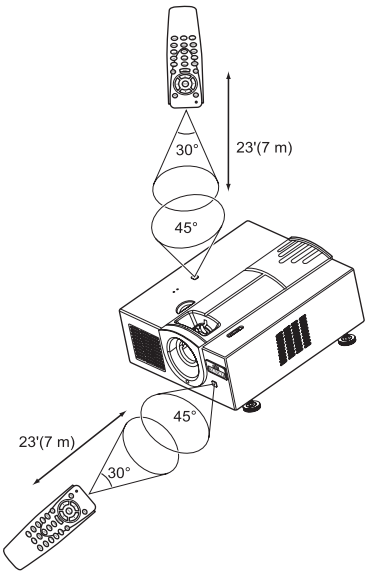
Aspect Ratio Buttons					
ANA	Press this button to select Anamorphic aspect ratio.	4X3	Press this button to select 4 x 3 aspect ratio.	LET BOX	Press this button to select Letterbox HD aspect ratio.
V-WIDE	Press this button to select VirtualWide aspect ratio.	CINEMA	Press this button to select Cinema aspect ratio.	V-CINE	Press this button to select Virtual Cinema aspect ratio.

Using the Remote Control

Available Range of the Remote Control

The remote control can be used to control the projector within the ranges shown in the illustration.

Note:
The signal from the remote control can be reflected by the screen.



When using the remote control:

- For best results, hold the remote control within 23 ft. (7m) of the back or top sensor and aligned within 30˚.
- Be sure not to drop the remote control or expose it to moisture or high temperature.
- The remote control may malfunction under a fluorescent lamp. If that occurs, move the projector away from the fluorescent lamp.

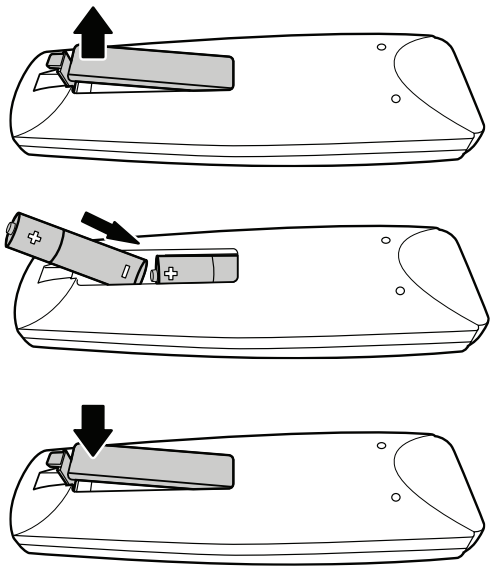
Inserting the Batteries

Two AAA batteries are included in the package.

1 Press down the tab on the cover and pull the cover in the direction of the arrow.

2 Insert the included batteries making sure the polarities correctly match the ⊕ and ⊖ marks inside the battery compartment.

3 Insert the lower tab of the cover into the opening, and press down the cover until it clicks in place.



Connections and Setup

Before Setting Up

Note:

- Before connecting, be sure to turn off both the projector and the sources to be connected. After making all connections, turn on the sources first, followed by the projector.

  When connecting a computer, be sure that the computer is the last device to be turned on after all the connections are made.
- Be sure to read the user manuals of the devices to be connected before making connections.
- After connecting the projector to other devices, you need to set the proper input for the projector. See “Selecting Input Source” on page 26.

Connecting the Projector to Other Devices

This projector can be connected to:

Video Equipment:

- VCR, Laser disc player or other video equipment with a Composite video output.
- DVD player or DTV decoder or other device with an S-video output.

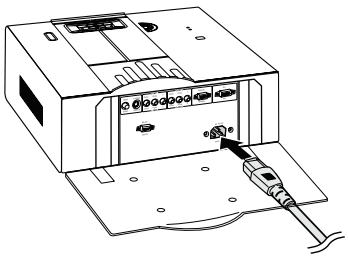
A Computer:

Connect to the computer with one of the following types of cable, depending on the specifications of your computer:

- HD 15-pin VGA to HD 15-pin VGA cable
- DVI-D to DVI-D cable
- RS-232C cable

Connecting the Power Cord

Plug the supplied power cord into the AC socket on the rear of the projector. Connect the other end of the cord to a power outlet.



Connecting to Video Equipment

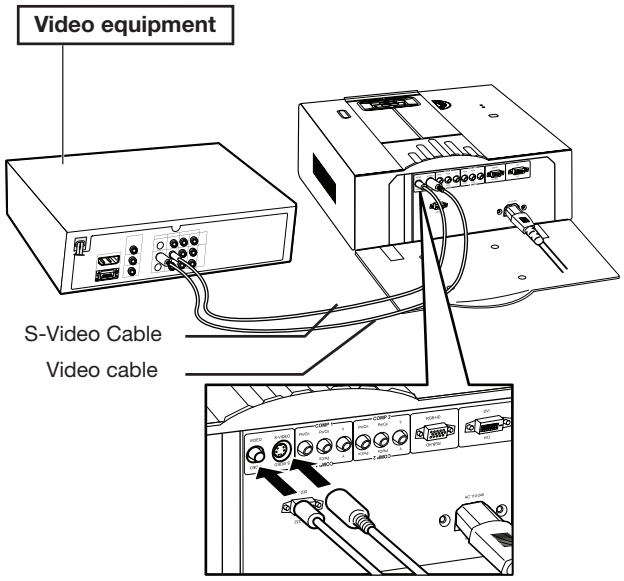
Connecting with S-Video or Composite Video Cable

You can connect devices equipped with Composite video or S-Video output, such as a VCR or laser disc player, to the Video or S-Video input using the appropriate cable.

1 Connect an S-Video or Composite video cable to the projector.
2 Connect the cable to the S-Video or Composite video output on the video equipment.

Note:

- Some Composite cables include red and white audio jacks. The video jack is yellow. You only need the video jack to connect to the projector.
- The S-VIDEO input uses a video signal system that separates the picture into color and luminance signals to realize a higher-quality image.

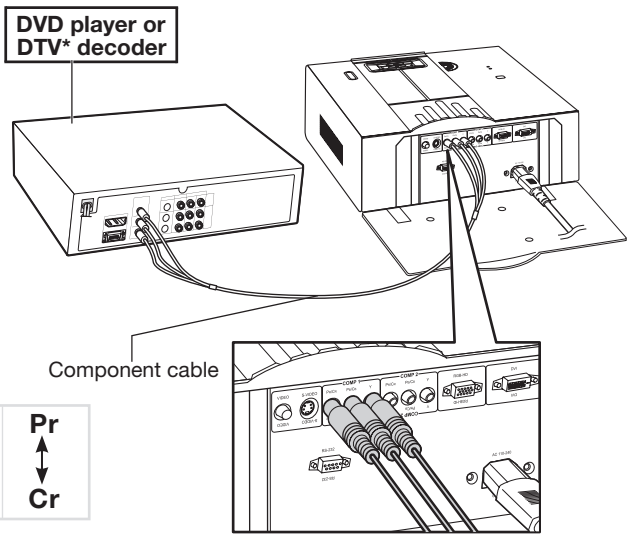


Connecting with Component Cable

You can connect devices equipped with component video output, such as a DVD player or DTV decoder, to the component 1 or 2 inputs.

1 Connect a component cable to the projector.

2 Connect the cable to the component output on the video equipment. The component output jack on some devices may be marked Y, Cb, Cr. Connect each jack as shown below.



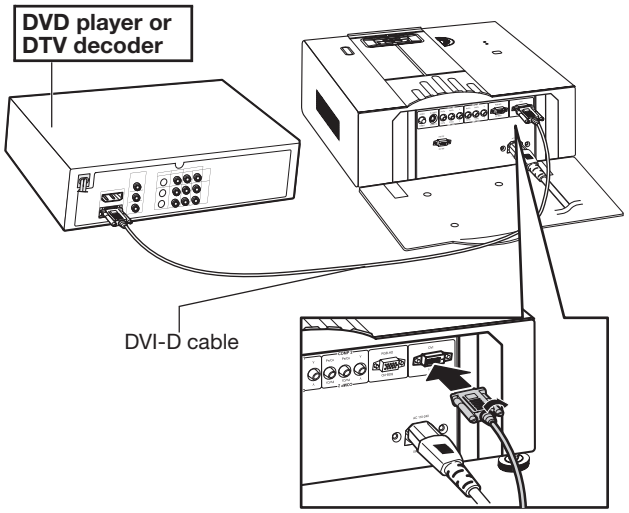
Projector	Y	Pb	Pr
DVD player or DTV Decoder	Y	Cb	Cr

Connecting to DVI Video Equipment

You can connect to devices equipped with DVI output, such as a DVD player or DTV decoder to the DVI input.

1 Connect a DVI-D cable to the DVI input on the projector. Secure the connectors by tightening the thumbscrews.

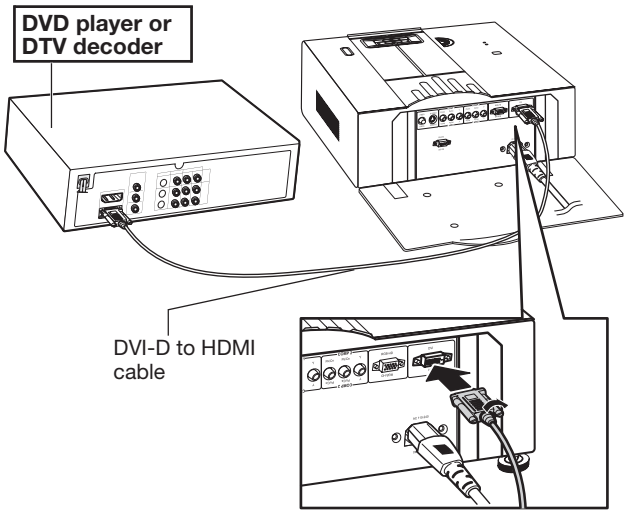
2 Connect the DVI-D cable to the DVI output on the video equipment. Secure the connectors by tightening the thumbscrews.



Connecting to HDMI Equipment with DVI-D to HDMI Cable

You can connect devices equipped with HDMI output to the DVI input using DVI-D to HDMI cable.

1 Connect a DVI-D to HDMI cable to the projector.
2 Secure the connectors by tightening the thumbscrews.
3 Connect the cable to the DVI-D output on the video equipment

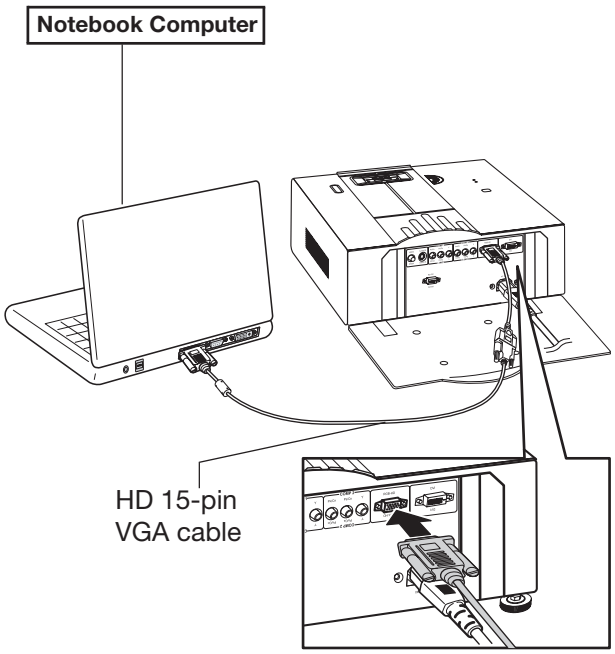


Connecting the Projector to a Computer

Connecting with HD15-pin VGA cable.

1 Connect an HD 15-pin VGA cable to the RGB HD input on the projector. Secure the connectors by tightening the thumbscrews.

2 Connect the VGA cable to the VGA output on the computer. Secure the connectors by tightening the thumbscrews.



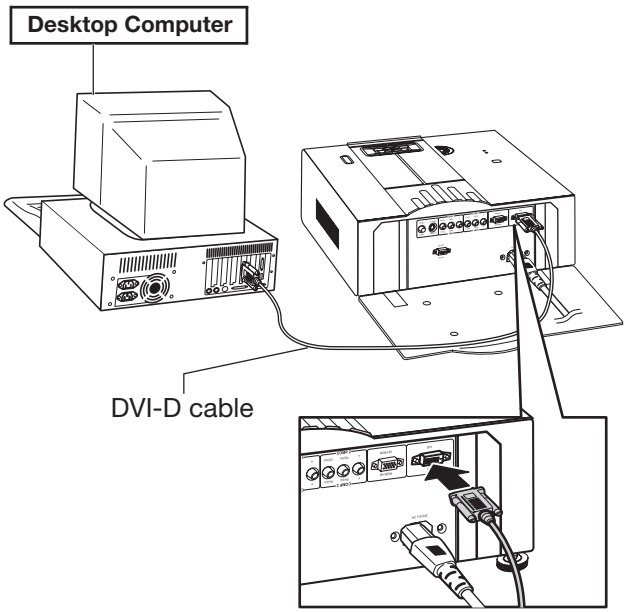
Note:

- See the “Computer Compatibility Chart” on page 49 for a list of computer signals compatible with the projector. Use with signals other than those listed may cause some functions not to work.
- When connecting a computer to the projector’s RGB-HD input, set the source to RGB-HD from the Source Select menu, or select RGB mode by pressing RGB-HD on the remote control.
- A Macintosh adaptor may be required for use with some Macintosh computers. Contact your nearest Authorized service center or dealer.
- Depending on the computer you are using, an image may not be projected unless the signal output setting of the computer is switched to external output. Refer to the computer user manual for switching the computer signal output settings.

Connecting the projector to a computer with DVI-D cable

1 Connect a DVI-D cable to the DVI / Computer input on the projector. Secure the connectors by tightening the thumbscrews.

2 Connect the cable to the DVI-D output on the video equipment. Secure the connectors by tightening the thumbscrews.



Plug and Play

- This projector is compatible with VESA-standard DDC 1/DDC 2B. The projector and a VESA DDC compatible computer communicate their setting requirements, allowing for quick and easy setup.
- Before using the Plug and Play function, be sure to turn on the projector first and the connected computer last.

Note:

- The DDC Plug and Play function of this projector operates only when used in conjunction with a VESA DDC-compatible computer.

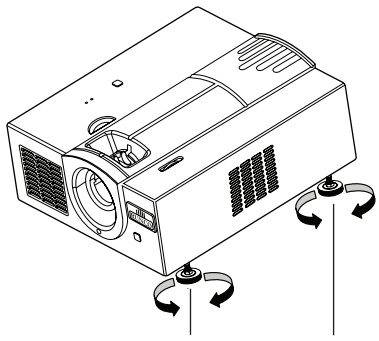
Using the Adjustment Feet

The height of the projector can be adjusted using the adjustment feet. This is useful for correcting the angle of the projection when the projector is placed on an uneven surface or when the screen is slanted. The adjustment feet are connected to threaded bolts, which can be turned in to shorten or out to lengthen.

1 Lift the side of the projector you would like ti raise or lower.

2 Turn the adjustment feet to shorten or lengthen. If the screen is at an angle, the adjustment feet can be set higher than the rear adjustment feet to set the image at an angle.

3 Return the projector to the original position.



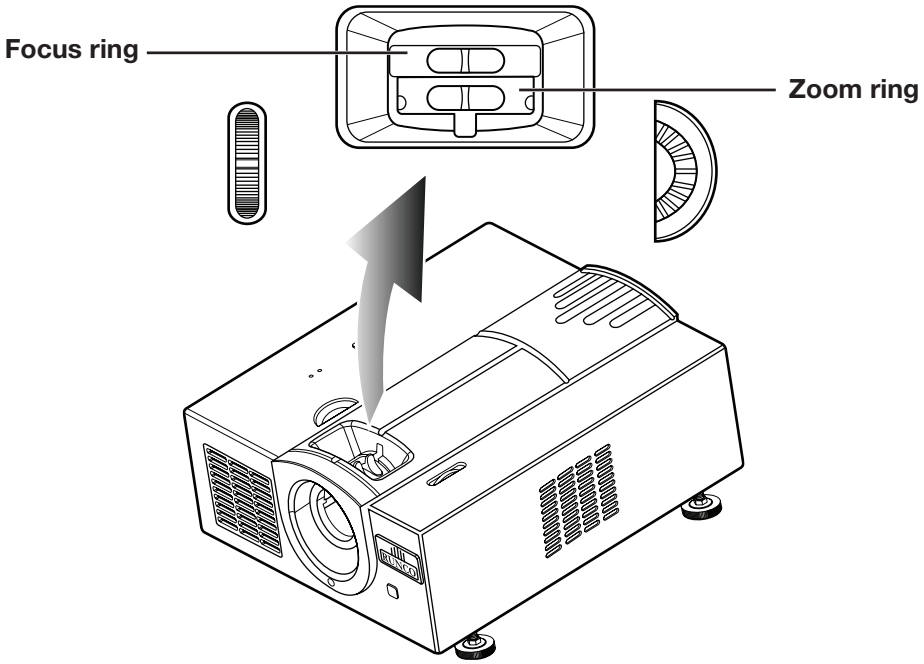
Adjustment feet

Note:

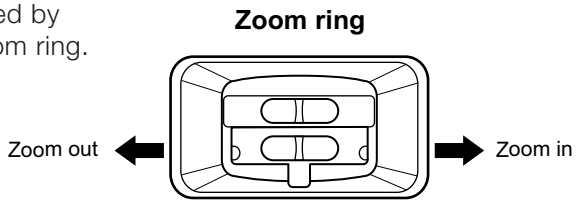
- When lowering the projector, be careful not to get your finger caught in the area between the adjustment foot and the projector.
- The projector is adjustable up to approximately 5 degrees from the standard position.
- When the height of the projector is adjusted, the image may become distorted (keystone distortion). See “Keystone” on page 44 for details on keystone correction.

Adjusting the Lens

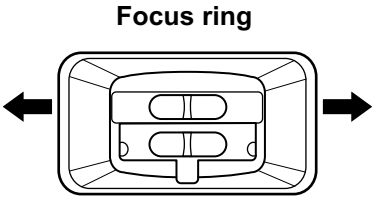
The image is focused by rotating the focus ring on the projector. The image can be adjusted to the desired size by rotating the zoom ring.



1 Zoom is adjusted by rotating the zoom ring.



2 Focus is adjusted by moving the focus ring right or left until focus is achieved.

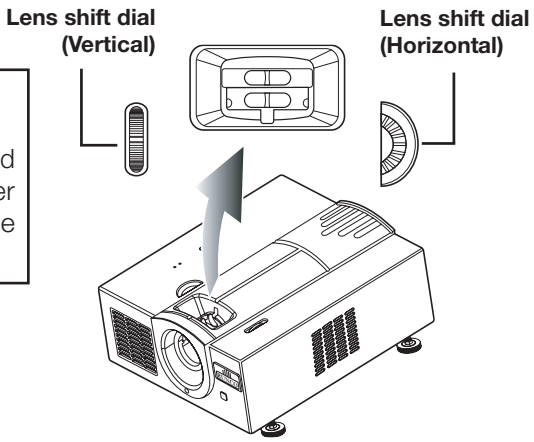


Using the Lens Shift

The height and width of the projected image can be adjusted to be within the shift range of the lens by rotating the lens shift dial at the top of the projector

Note:

Do not force the lens shift dial beyond the range of the upper left and lower right positions. This may cause the projector to malfunction.



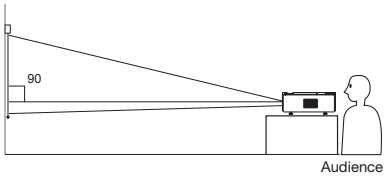
Setting Up The Screen

Position the projector perpendicular to the screen with all feet flat and level to achieve an optimal image.

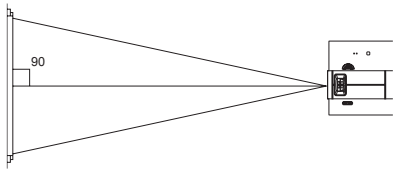
Standard Setup (Front Projection)

Place the projector at the required distance from the screen according to the desired picture size.

Side



Top View

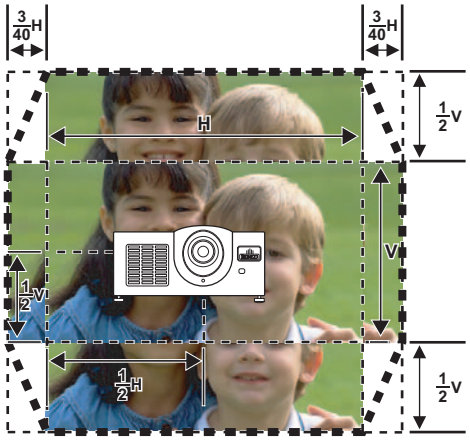


Example of a Standard Setup

- The distance from the screen to the projector depends on the size of the screen.
- The default setting can be used, when placing the projector in front of the screen. If the projected image is reversed or inverted, change the Picture Configuration setting to Front from the Installation menu. See “Reverse Projection” on page 23.
- Place the projector so that an imaginary horizontal line that passes through the center of the lens is perpendicular to the screen.

Note:

- The projector lens should be centered on the screen. If the horizontal line passing through the lens center is not perpendicular to the screen, the image will be distorted, making viewing difficult.
- For an optimal image, position the screen so that it is not in direct sunlight or artificial light. Light falling directly on the screen washes out the colors, making viewing difficult. Close the curtains and dim the lights when setting up the screen in a sunny or bright room.
- A polarizing screen cannot be used with this projector.



Note:

The lens can be adjusted vertically and horizontally:

- The vertical display (Biggest) is ±1/2 screen. (±100%)
- The horizontal display (Biggest) is ±3/40 screen. (±15%)
- It is recommended that images be projected onto the dashed line octagonal area for fine image quality.
- There is a tolerance of ±3% in the formula above.

Projection Distance

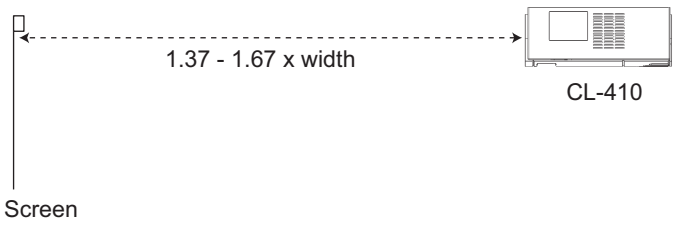
◄ **Projection Distance**

The Projection Distance (also known as 'throw distance') is the distance the projector needs to be from the screen for a given screen size. This is measured from the projector's lens to the screen, in a straight line (not the center of the screen).

For the CL-410, the formula is:

1.37 to 1.67 x screen width

For example, if your screen width is 100", the projection distance range would be between 137" and 167"



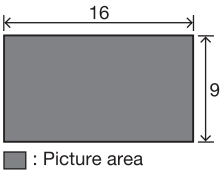
Throw Distance Chart

CL-410 @ 1.37 to 1.67 Lens					
Screen Height	Screen Width	Minimum Throw Distance	Maximum Throw Distance	Vertical Offset	Horizontal Offset
36.5	65	89.01	108.50	18.25	6.50
40.5	72	98.76	120.39	20.25	7.21
43.0	77	104.86	127.82	21.50	7.65
45.0	80	109.74	133.77	22.50	8.01
47.0	84	114.61	139.71	23.50	8.37
49.0	87	119.49	145.66	24.50	8.72
50.0	89	121.93	148.63	25.00	8.90
51.5	92	125.59	153.09	25.75	9.17
52.0	93	126.81	154.58	26.00	9.26
54.0	96	131.68	160.52	27.00	9.61
56.0	100	136.56	166.47	28.00	9.97
58.0	103	141.44	172.41	29.00	10.32
58.5	104	142.66	173.90	29.25	10.41
60.0	107	146.32	178.36	30.00	10.68
61.0	109	148.75	181.33	30.50	10.86
63.0	112	153.63	187.27	31.50	11.21
Screen Height	Screen Width	Min. TD	Max. TD	Vertical Offset	Horizontal Offset
		SWx1.37	SWx1.68	0 to 0 less SHx50%	

Example of vertical offset:
Inverted CL-410, lens may be at screen-top to 1/2 way down

Example of vertical offset:
Upright CL-410, lens may be at screen-bottom to 1/2 way up

When using a wide screen (16:9)
When displaying a 16:9 picture on the whole area of the 16:9 screen.



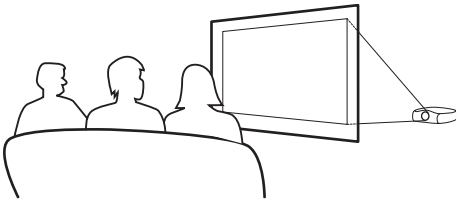
Reverse Projection

When you project from behind the screen (rear projection), using a mirror, or from a ceiling mount, you need to reverse the image so that the image the audience sees is correctly oriented. The Picture Configuration item in the Installation menu enables you to adjust images for these types of projection.

Rear Projection

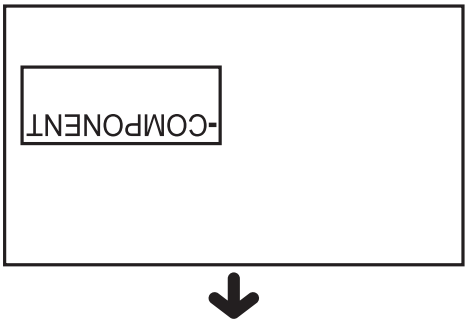
■ Place a transparent screen between the projector and the audience.

■ Reverse the image by setting **Picture Configuration** to **Floor Rear** in the **Installation** menu. See “Installation” on page 41.



When using the default setting

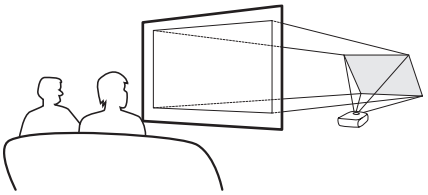
▼On-screen Display



The image is reversed.

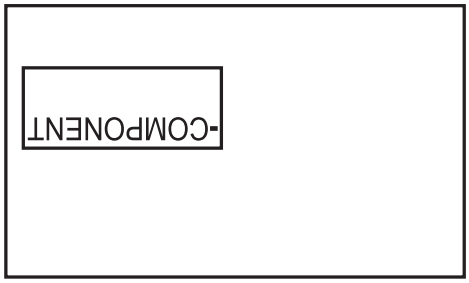
Projection using a mirror

■ Place a normal flat mirror in front of the lens.



When using the default setting

▼On-screen Display



The image is reversed.

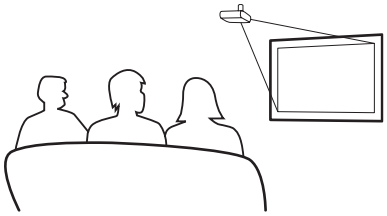
■ If the mirror is placed on the side of the audience, reverse the image by setting **Picture Configuration** to **Floor Rear** in the **Installation** menu. See “Installation” on page 41.

Note:

When using a mirror, be sure to position both the projector and the mirror so that the light does not shine into the eyes of the audience.

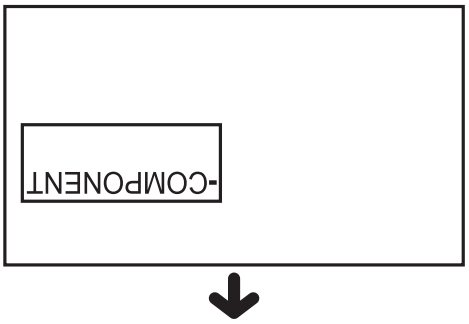
Ceiling-mount setup

- It is recommended you use the optional ceiling-mount bracket for this installation. Before mounting the projector, contact your nearest Runco Authorized Service Center or Runco Dealer to obtain the recommended ceiling mount bracket (sold separately).
- Be sure to adjust the position of the projector to match the distance (Z) from the lens center position to the lower edge of the image, when mounting the projector on the ceiling.
- Invert the image by setting **Picture Configuration** to **Ceiling Front** in the **Installation** menu. See “Installation” on page 41.



When using the default setting

▼On-screen Display



The image is reversed.

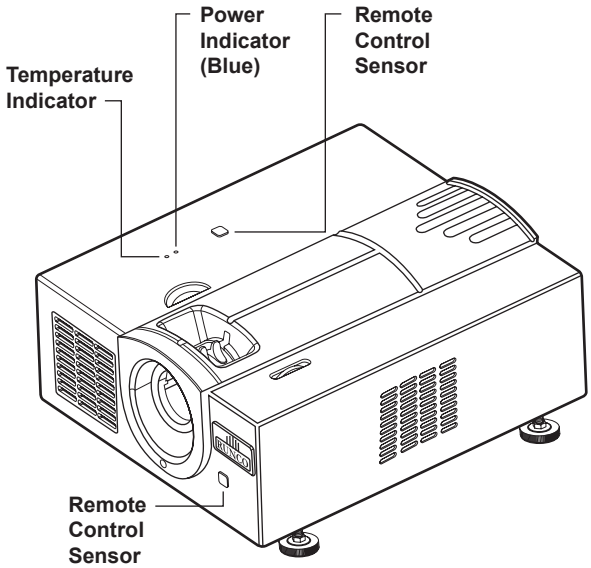
Basic Operation

Basic Procedure

Connect the required external equipment to the projector before completing the following procedures. The display language preset at the factory is English. For information on changing the display language, see “Display Language” on page 27.

1 Plug the power cord into the wall outlet. The power indicator lights blue, and the projector enters standby mode.

2 Press the power (ON) button on the remote control. The blue power indicator turns off.



Note:

Power indicator:

- The power indicator lights up, indicating the status of the projector.

  Blue: The projector is in standby mode.

  Blue blinking: The fan is cooling.

  Blue light off: The projector is on.
- You may need to wait several seconds for the projector to warm up before light is projected.

Temperature indicator:

- The projector has a temperature warning LED on the control panel. If the projector overheats because of a dirty filter or any other problem, the LED flashes and the projector lamp turns off, after which a 90-second cooling off period occurs. After restarting the projector, if the unit doesn’t operate normally, take the projector for servicing.

Selecting Input Source

1 Press one of the source buttons on the remote control, such as VIDEO, to select an input source, or move through input sources using the ◀ left and ▶ right buttons on the remote control.

Note:

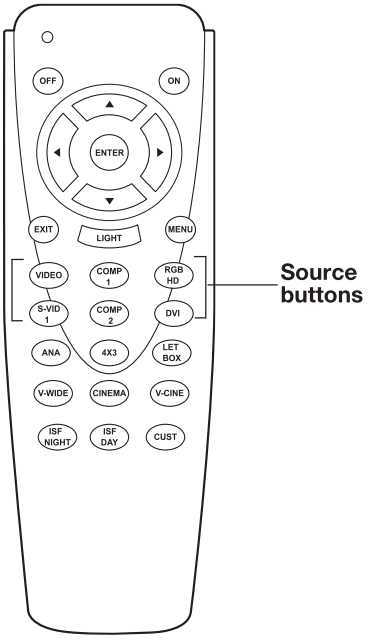
• When a signal is not received, "Searching" is displayed.

About the source input modes

Video	Use this option to select the composite video input source.
Component 1 and 2	Use this option to select a YPbPr, SDTV, or HDTV component input source.
RGB HD	Use this option to select RGB HD input source (computer input).
S-Video	Use this option to select the S-Video input source.
DVI	Use this option to select the DVI input source.

Note:

You can choose either manual or automatic source detection. For more information on setting manual or automatic detection, see "Source Detect" on page 42.



2 Press the OFF button on the remote control to turn off the projector, when the confirmation message is displayed.

Note:

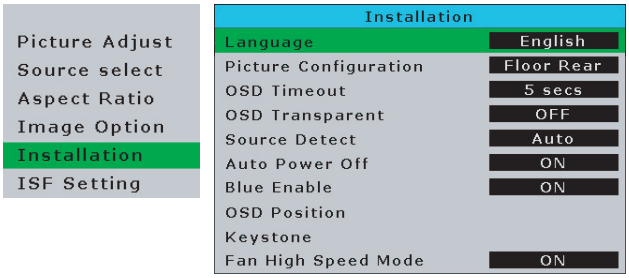
- Do not unplug the power cord during projection or cooling fan operation. This can cause damage due to the rise in internal temperature, as the cooling fan also stops.
- If you accidentally press the power (ON) button and do not want to turn off the projector, press the EXIT button or wait until the confirmation message disappears.

Display Language

The on-screen display language of the projector can be set to English, Français, Italiano, Deutsch, or Español.

1 Press the MENU button on the remote control. The menu is displayed.
2 Select the Installation menu using ▲▼.
3 Press ENTER or ▶ to select Language.
4 Press ◀ ▶ to select desired language, and then press ENTER. The desired language is set for the on-screen display.
5 Press EXIT.

Main Menu

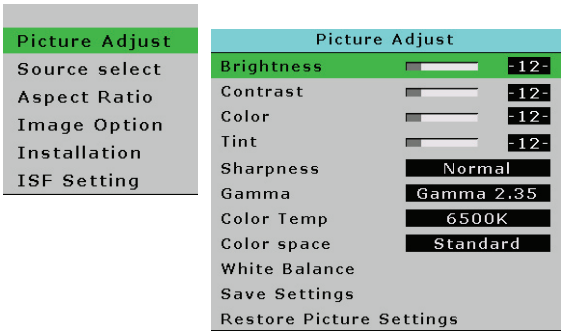


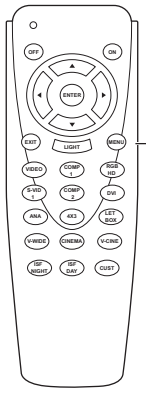
Using Menus

This projector has a set of menu screens that enable you to adjust the image and various projector settings. You can operate the menus from the projector or remote control.

1 Press the MENU button on the remote control. The menu screen is displayed.
2 Press ▲ or ▼ to select the menu you want to adjust.
3 Press ◀ or ▶ to reach the Sub-menu and then press ▲ or ▼ to select the item you want to adjust. The selected item is highlighted.
4 Press ◀ or ▶ to adjust the item selected. The adjustment is stored.
5 Press Exit to return to the Main MENU.

Main Menu





Note:

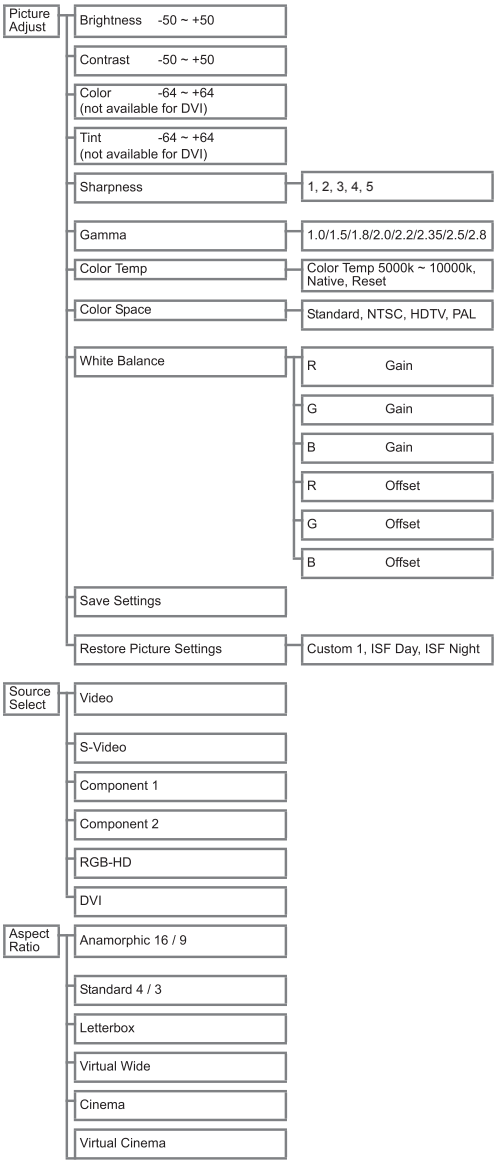
Some menu options are not available while input is set to the following sources:

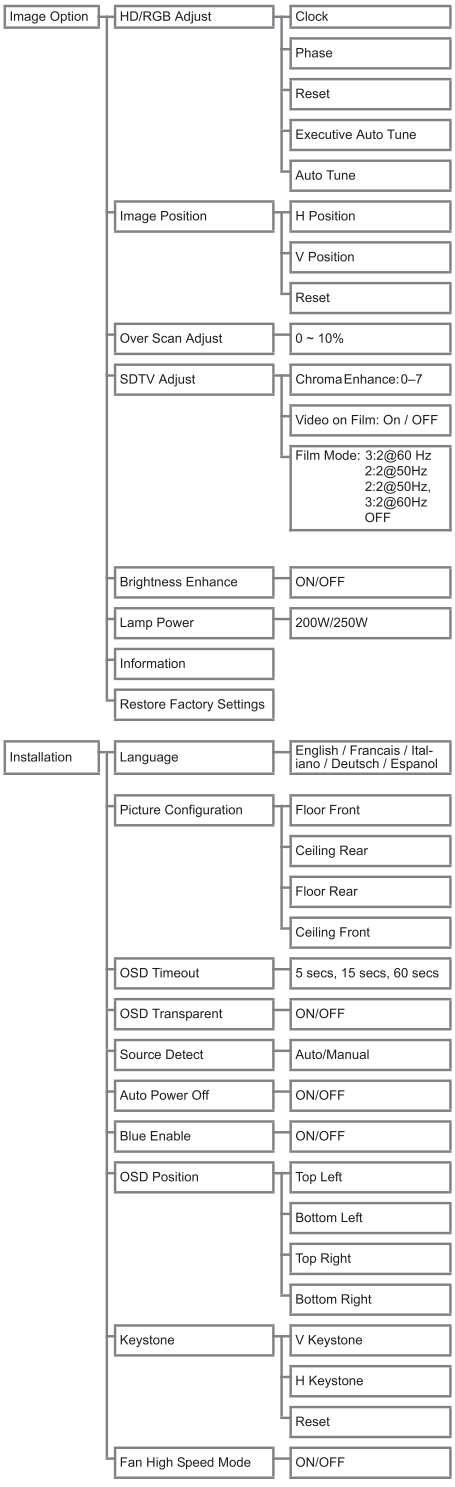
- Computer (RGB HD or DVI) sources
- Component 1 and 2 sources

Separate menu tables are shown below for computer and component 1 and 2 sources

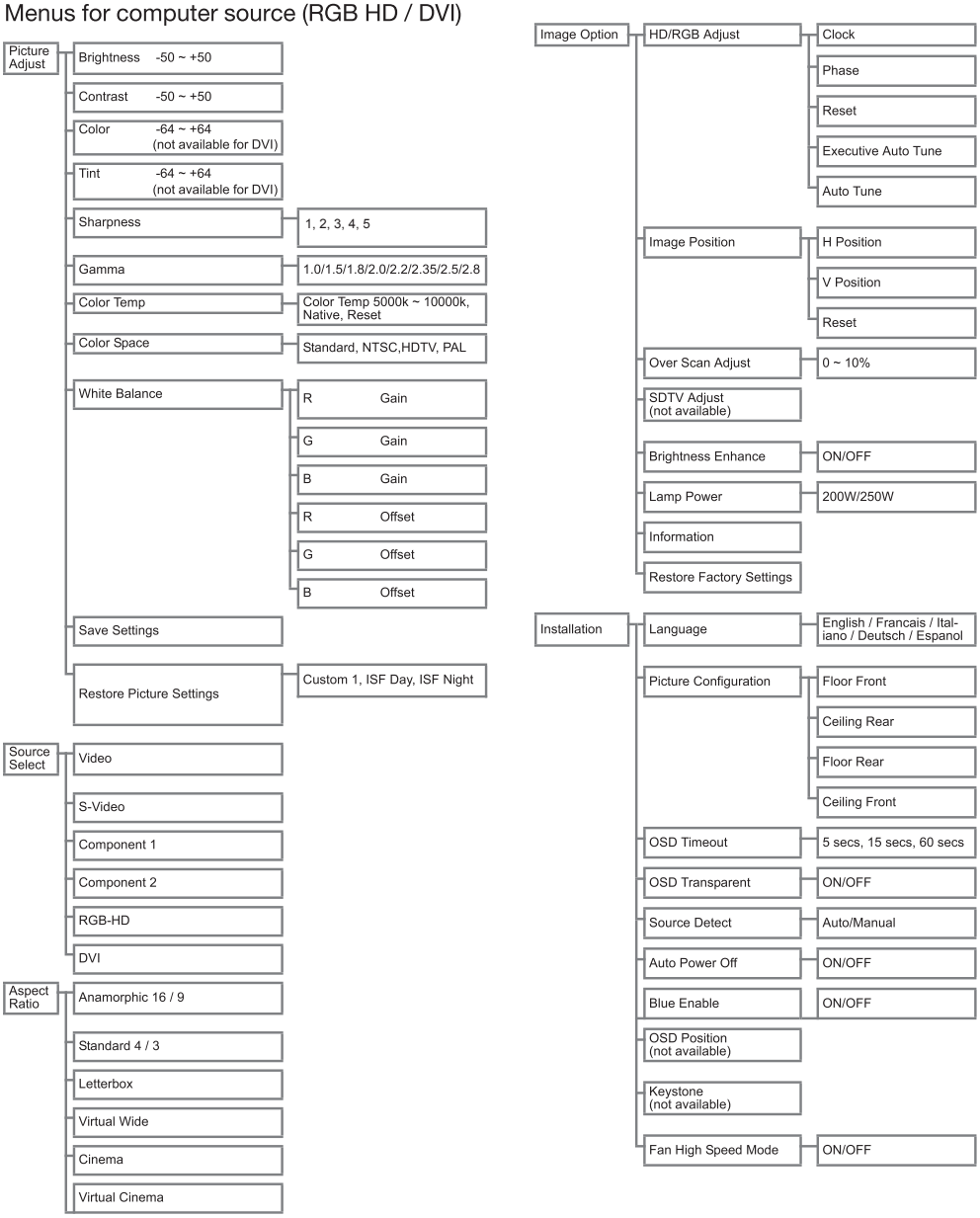
Menu Items

The following tables show items in the menus.

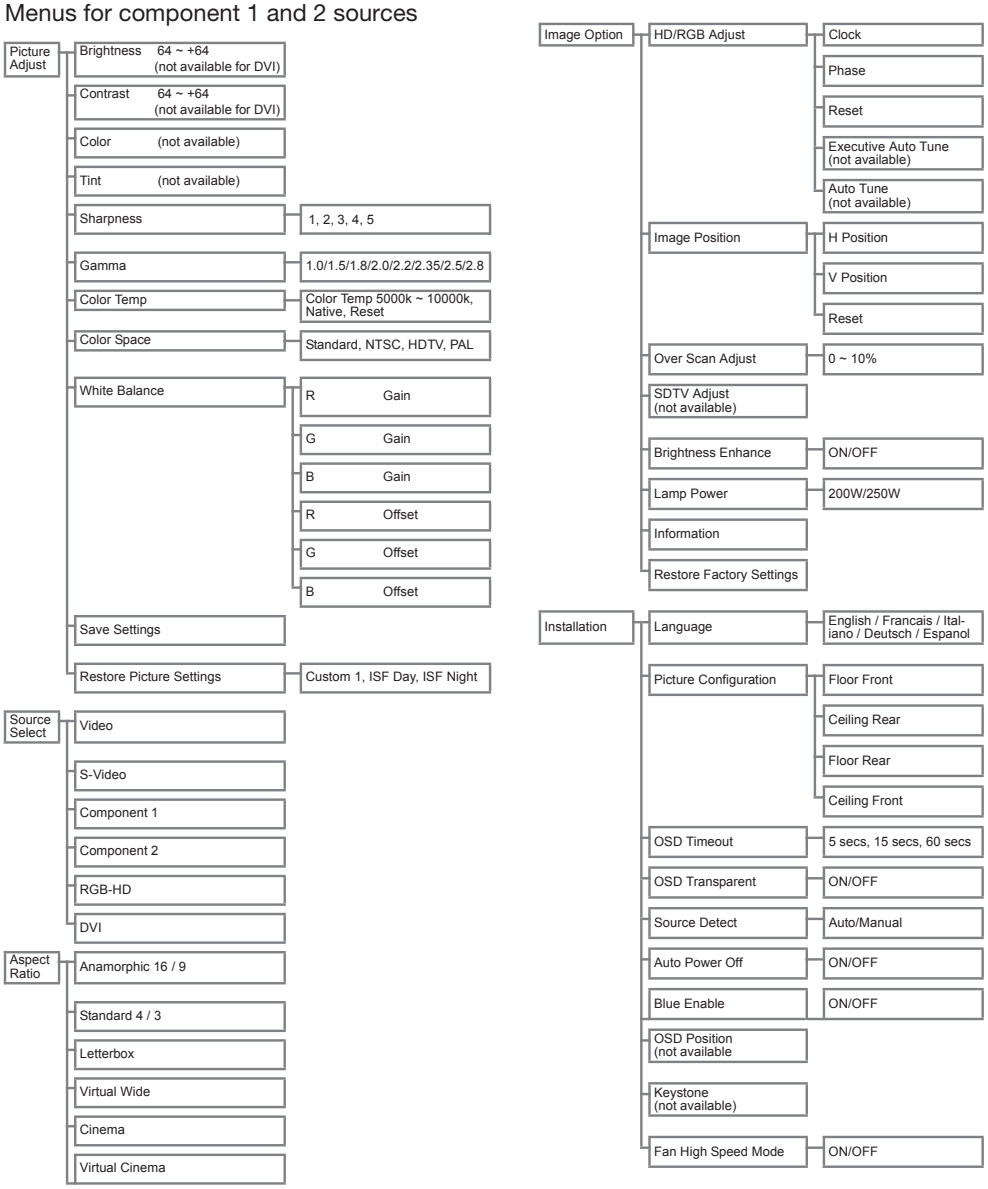




Menus for computer source (RGB HD / DVI)

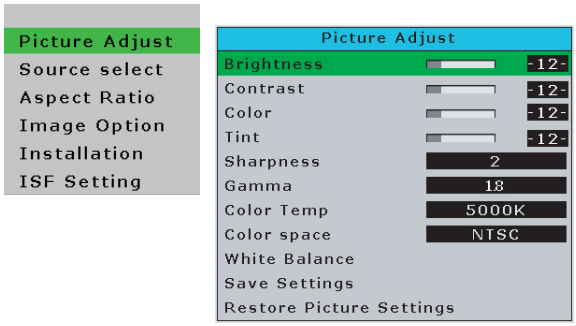


Menus for component 1 and 2 sources



Adjusting the Picture

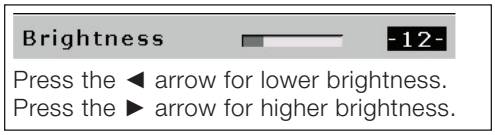
Main Menu



In the **Picture Adjust** menu, you can adjust Brightness, Contrast, Color, and other settings to control the appearance of projected images.

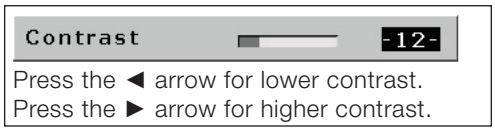
◄ *Brightness*

Use this option to adjust the overall **Brightness** of the image. Use this control in conjunction with contrast to fine-tune the display. The scale is from -50 to 50. The default setting is 0.



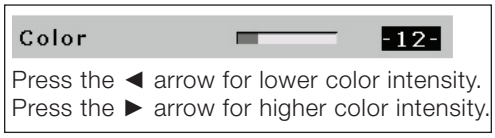
◄ *Contrast*

Use this option to adjust the **Contrast** of the image. Use this control in conjunction with brightness to fine-tune the display. The scale is from -50 to 50. The default setting is 0.



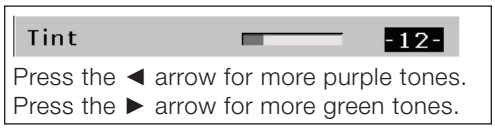
◄ *Color*

Use this Option to adjust the **Color** intensity of the image.



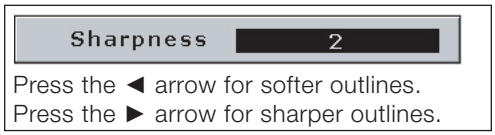
◄ *Tint*

Use this option to adjust the **Tint** of your image.



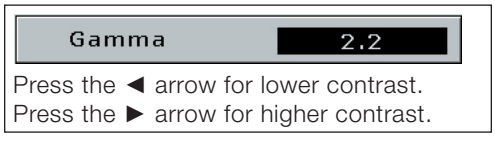
◄ *Sharpness*

Use this option to adjust the clarity and focus of the image. Select from Soft, Softest, Normal, Sharp, and Sharpest. The scale is from 1 - 5.

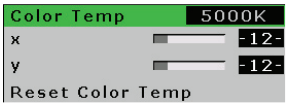


◄ *Gamma*

Gamma correction is another method for adjusting the brightness of the image. Default setting is 2.2. Gamma correction provides seven non-linear gamma corrections: 1.0, 1.5, 1.8, 2.0, 2.2, 2.35, 2.5, and 2.8.



Color Temperature ➤ Use this option to set the color temperature of the image. Higher color temperatures make the image look cool with a bluish hue. Lower color temperatures make the image look warmer with a reddish hue. The range is from 5000°K to 10000°K, with increments of 500°K. Adjust x and y coordinates to adjust the color temperature.



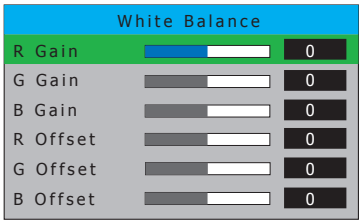
x adjustment	y adjustment	Result
▶	◀	red hues
◀	◀	blue hues
◀	▶	green hues
▶	▶	yellow hues

Color Space ➤ Color space refers to the range of colors used for different video standards. If you are projecting input from video equipment, such as a DVD player, select the relevant color space or make adjustments here. Settings adjust values for Red, Green, Blue (RGB) and Cyan, Magenta, Yellow (C,M,Y), depending on the video standard.

Note:
Any changes to NTSC, HDTV and PAL must be made in the ISF menu.

Color Space Options
Standard
NTSC
HDTV
PAL

White Balance ➤ White balance fine tunes colors to make whites truly white. When adjusting white balance, project an image with plenty of white areas. White balance is adjusted through offset and gain channels for individual colors (RGB).



Save Settings ➤ This function stores current Picture Adjust settings such as Brightness and Contrast. These settings will then be in effect the next time you turn on the projector.

The menu asks you if you would like to "Save Picture Settings to Custom 1."
If Yes, press **ENTER**.
If No, press **EXIT**.

Restore Picture Settings ➤ Select this option to reset all items in the "Picture" menu. Reset to Custom 1, ISF Day, or ISF Night settings. ISF refers to standard video settings established by the Imaging Science Foundation.

Easy-to-Use Functions

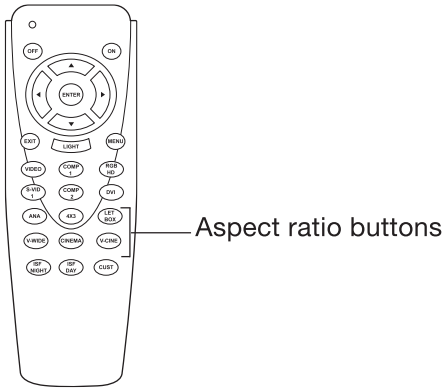
Aspect Ratio

This function enables you to modify or customize the aspect ratio. The aspect ratio refers to the picture display mode and the proportions of the screen image. Depending on the input signal, you can choose (16x9) Anamorphic, (4x3) Standard, LetterBox, VirtualWide, Cinema, or Virtual Cinema aspect ratios. Aspect ratio can be adjusted with the remote control or from the on-screen settings menu.

Changing Aspect Ratio with the Remote Control

Use the aspect keys on the remote control to change aspect ratio. There are six aspect keys on the remote control, one for each aspect ratio.

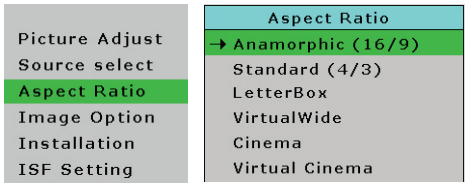
Button	Aspect Ratio
ANA	Anamorphic
4 × 3	Standard
LET BOX	Letterbox aspect
V-WIDE	Virtual Wide
CINEMA	Cinema
V-CINE	Virtual Cinema



Changing Aspect Ratio with the Settings Menus

1 Select Aspect Ratio from the main settings menu.
2 Use ▼ ▲ to select the desired aspect ratio, then press ENTER.

Main Menu

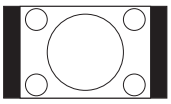


The following tables give details for various aspect ratios, including ratios, resolutions in pixels, supported video standards, and graphics to show the screen appearance.

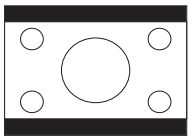
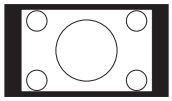
There are two different sets of tables: One set for images input from video equipment, and one set for input from a computer.

For example, an image projected using standard aspect resolution appears as a rectangle with the following qualities:

- The width and height of this rectangle in pixels are 1024 x 576.
- The proportion of width to height, expressed as a ratio, is 4:3.



The graphic on the right shows the appearance of the projected image. As the graphic shows, there are no cropped areas; however, there is space on the right and left sides of the image

	Input Signal	Standard
NTSC	 Letter box image	 Projected image

Note:
Some video equipment also contains aspect ratio settings. Thus, two different ratio aspects could be applied - one from the video equipment, and one from the projector. The tables show the results for various combinations of aspect ratios. For example, if your video equipment (NTSC standard) is set to Letterbox and the projector is set to Standard aspect resolution, the projected image looks like the graphic on the far right.

Table 1: Descriptions of six aspect ratio settings

Anamorphic	Standard	Letterbox
• Resolution 1024 x 576 • 4:3 input is stretched to fit 16:9 display • Stretches entire image	• Resolution 1024 x 576 • All input fits 4:3 display	• Resolution 1024 x 576 • 4:3 input scaled to fit display width • Height scaled to maintain 4:3 aspect ratio: 1024 x 576 • 25% of the entire image on the top and bottom is cropped

VirtualWide	Cinema	Virtual Cinema
• Resolution 1024 x 576 • 4:3 input is stretched to fit 16:9 display • Both sides of image are stretched	• Resolution 1024 x 576 • All input is stretched to fit 16:9 display • 25% of image on top. Bottom is blank	• Resolution 1024 x 576 • All input is stretched to fit 16:9 display • 25% of the image is on the top. The bottom is cropped • 25% of the image is on the left and right is cropped

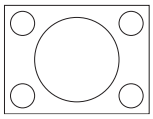
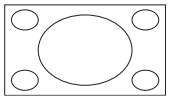
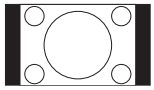
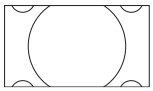
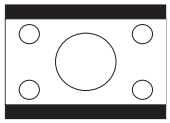
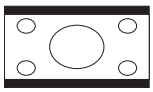
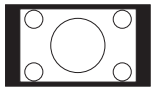
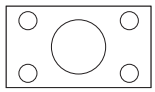
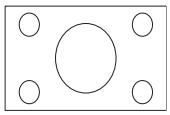
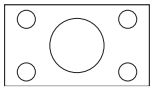
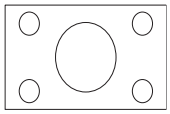
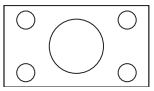
Video

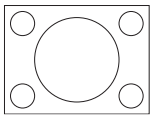
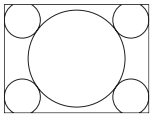
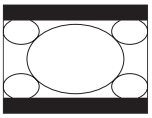
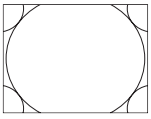
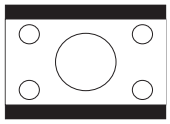
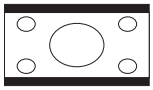
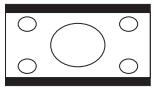
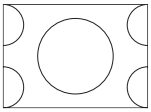
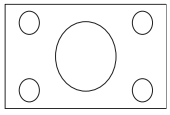
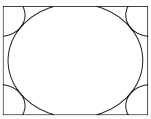
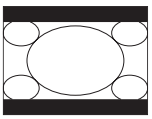
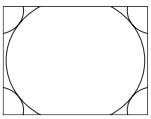
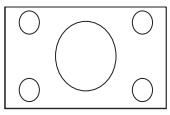
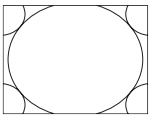
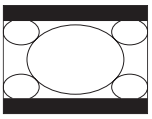
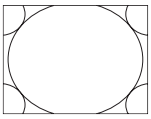
Table 2: Resolution (in pixels)

Input	Video Equipment Standard	Anamorphic	Standard (4 × 3)	Letterbox
4:3 Aspect Ratio	480i, 480P 576i, 576P NTSC, PAL, SECAM	1024 × 576	768 × 576	1024 × 576
16:9 Aspect Ratio	480P 576P	1024 × 576	768 × 576 768 × 576	1024 × 576 1024 × 576
	720P	1024 × 576	—	—
	1080i	1024 × 576	—	—

Input	Video Equipment Standard	VirtualWide	Cinema	Virtual Cinema
4:3 Aspect Ratio	480i, 480P 576i, 576P NTSC, PAL, SECAM	1024 × 576	1024 × 576	1024 × 576
16:9 Aspect Ratio	480P 576P	1024 × 576	1024 × 576	1024 × 576
	720P	1024 × 576	1024 × 576	1024 × 576
	1080i	1024 × 576	1024 × 576	1024 × 576

Table 3: Aspect ratios: appearance on screen

	Input Signal	Output screen image		
		Anamorphic	**Standard**	**Letterbox**
480I 480P 576I 576P NTSC PAL SECAM	 For 4:3 aspect ratio			
	 Letter box image			
1080I	 For 16:9 aspect ratio			
720P				

	Input Signal	Output screen image		
		Virtual Wide	**Cinema**	**Virtual Cinema**
480I 480P 576I 576P NTSC PAL SECAM	 For 4:3 aspect ratio			
	 Letter box image			
1080I	 For 16:9 aspect ratio			
720P				

Computer

Table 4: Resolutions (in pixels)

Input Signal		Anamorphic	Standard	
4:3 aspect ratio	VGA (640 × 480)	1024 × 576	768 × 576	
	SGVA (800 × 600)	1024 × 576	768 × 576	
	XGA (1024 × 768)	1024 × 576	768 × 576	
	Computer Resolution	**Virtual Wide**	**Cinema**	**Virtual Cinema**
4:3 aspect ratio	VGA (640 × 480)	1024 × 576	1024 × 576	1024 × 576
	SGVA (800 × 600)	1024 × 576	1024 × 576	1024 × 576
	XGA (1024 × 768)	1024 × 576	1024 × 576	1024 × 576

Table 5: Aspect ratios: appearance on screen

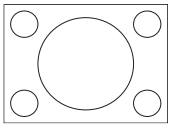
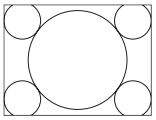
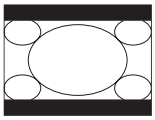
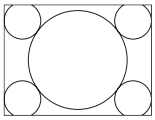
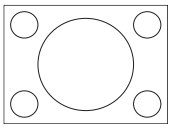
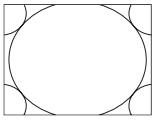
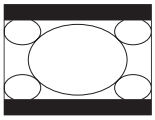
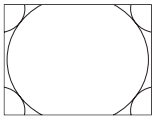
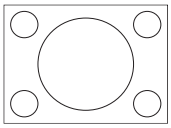
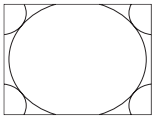
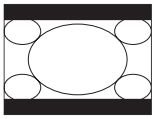
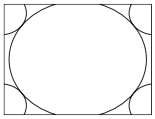
	Input Signal	Output screen image		
		Virtual Wide	Cinema	Virtual Cinema
VGA	 For 4:3 aspect ratio (640x480)			
SVGA	 For 4:3 aspect ratio (800x600)			
XGA	 For 4:3 aspect ratio (1024x768)			

Image Options

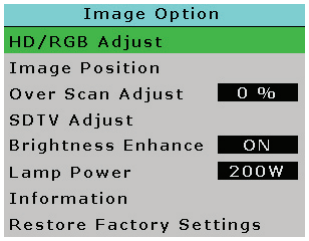
HD/RGB Adjust ➤

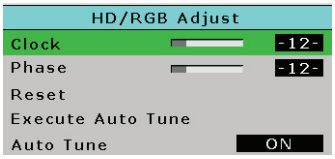
The Picture Adjust and Aspect settings enable you to adjust the size and position of the projected image. In the Image Option menu, you can adjust settings that affect the quality of the image.

Adjust projected images from a computer with HD / RGB Adjust settings.

When projecting computer images, interference such as flickering or vertical stripes may occur when displaying tilings or vertical stripes. Should this occur, adjust Clock and Phase to optimize the image.

Main Menu





Selected item	Description
Clock	Adjusts vertical noise.
Phase	Adjusts horizontal noise (similar to tracking on a VCR).

Select Reset if you would like to restore the original Clock and Phase settings.

Auto Tune automatically adjusts settings to optimize computer images.

Auto tuning can be executed on command or executed automatically by the projector whenever computer images are input.

To execute auto tuning on command, select **Execute Auto Tune**, then press the ENTER button.

To enable auto tuning, select Auto Tune, then select ON.

Note:

Auto Tune adjustment may take some time to complete, depending on the image stored in the computer connected to the projector.

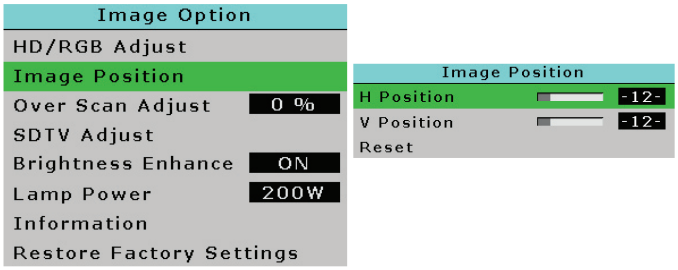
◄ *Image Position*

This function enables you to adjust the horizontal and vertical position of the display.

1 Select Image Position from the Image Option menu. Press ENTER.
Slider bars for adjusting horizontal and vertical position appear.

2 Use ▼ ▲ to select H position, V position, or Reset.
Select H position to move the image right and left. Select V position to move it up and down. Press ◄ or ► to increase or decrease values.To reset the image position, use ▼ ▲ to select Reset and press ENTER.

Main Menu



◄ *Over Scan Adjust*

The projector can overscan to improve the quality of the borders of the image, meaning that it scans more of an image than it actually projects.

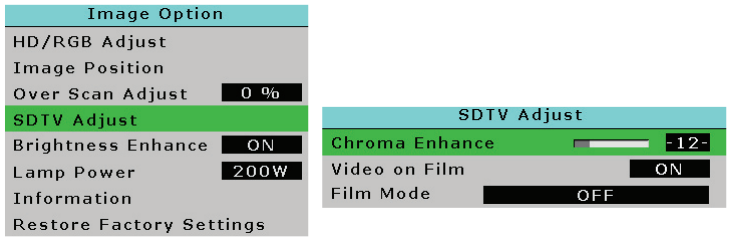
Overscan can be set from 0 to 10%.

◄ *SDTV Adjust*

SDTV is a standard for digital televisions. There are several SDTV settings to adjust to optimize input from a digital television.

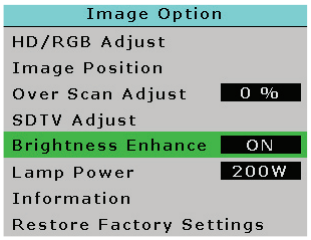
Select SDTV from the Image Option menu, then press ENTER to view SDTV adjustment slider bars.

Main Menu



Item	Description	Setting
Chroma Enhance	Chroma Enhance enhances the edges of a video image.	1 – 7
Video on Film	Video on Film repairs distortions or abnormalities in a video image.	
Film Mode	Film Mode helps to reproduce images clearly and optimizes image quality.	ON / OFF
		3 : 2 @ 60 Hz
		2 : 2 @ 50 Hz
		2 : 2 @ 50 Hz / 3 : 2 @ 60 Hz

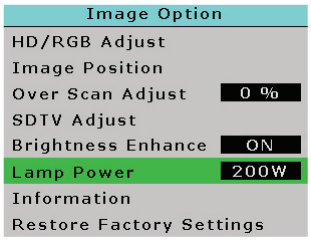
Brightness Enhance ➤ Main Menu



Brightness Enhance adds additional brightness to the display. Set to ON to enable.

Brightness Enhance Options
ON
OFF

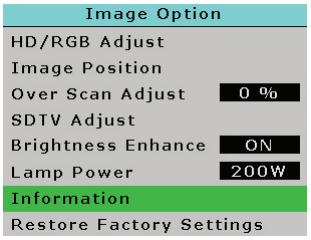
Lamp Power ➤ Main Menu



The Lamp Power function enables you to choose between two power levels. Choose the 250 W option to add additional brightness or aid in projecting from longer distances.

Lamp Power Options
200 W
250 W

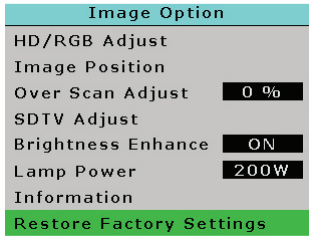
Information ➤ Main Menu

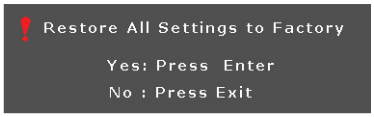


Information displays information about the current source, resolution, vertical frequency, horizontal frequency, and lamp timer.

The lamp time displays the number of hours the lamp has been in use. This is useful for lamp maintenance. See “Lamp Maintenance” on page 47.

Restore Factory Settings ➤ Main Menu





Use this setting to reset all items in the Image Options menu to their factory default values.

1. Select Restore Factory Settings, then press ENTER.
2. A warning message appears. Select Yes to continue. Press Exit to discontinue. After selecting Yes, the projector powers off and restarts.

Installation

The Installation menu enables you to adjust source detection and the language and appearance of settings menus, keystone adjustment, and others.

◄ *Language*

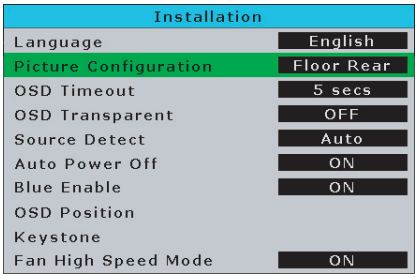
The on-screen display language of the projector can be set to English, Français, Italiano, Deutsch, or Español. For more information, see “Display Language” on page 27.

This projector is equipped with a reverse / invert image function that allows you to reverse or invert the projected image for various applications.

◄ *Picture Configuration*

Setting the Picture Configuration

Select Picture Configuration, then press ◄ or ► to scroll through four options.

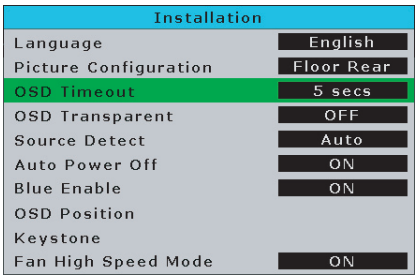


Selected item	Description
Floor Front	Normal image
Ceiling Front	Inverted image
Floor Rear	Reversed image
Ceiling Rear	Reversed and inverted image

Note:

This function is used for reversed image and ceiling-mount setups. See “Reverse Projection” on page 23.

◄ *OSD Timeout*



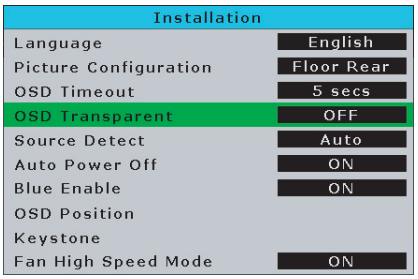
OSD Timeout sets the amount of time that a menu remains on screen when no buttons are pressed.

OSD Timeout Options
5 secs
15 secs
60 secs

Note:

OSD stands for On-Screen Display, and refers to the on-screen menus.

OSD Transparent ➤

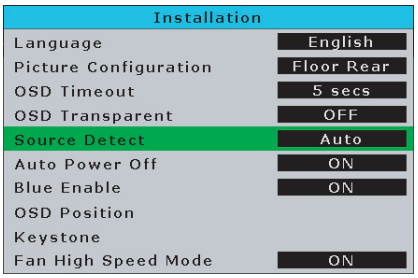


This function allows you to set the transparency of the OSD menu.

When set to transparent, you can see the image behind the menu.

Setting	Description
ON	On-screen displays are transparent
OFF	On-screen displays are not transparent

Source Detect ➤



Source Detect enables you to select automatic or manual source detection.

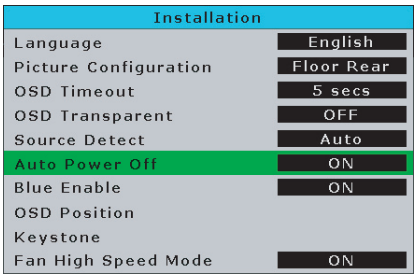
For information on input sources, see “Selecting Input Source” on page 26.

Source Detect Options
Automatic
Manual

Auto Power Off ➤

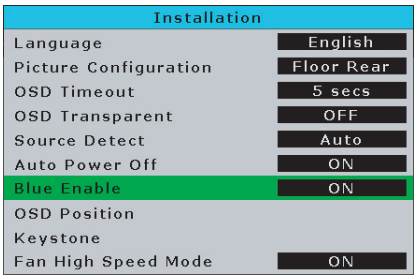
Auto Power Off can be enabled or disabled. When enabled, the projector automatically turns off after 15 minutes of no input signal or no buttons pressed.

Select ON to enable and OFF to disable Auto Power Off.



Note:

When the Auto Power Off function is set to ON, 5 minutes before the power turns off, the message “Power OFF in 5 min” appears on the screen to indicate the number of minutes remaining.

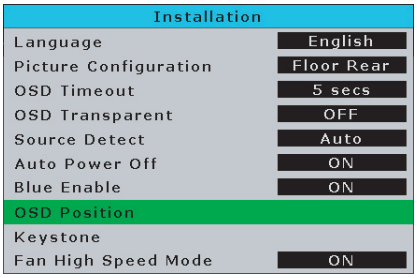


➤ ***Blue Enable***

Blue Enable turns off the red and green colors so that only blue appears. Settings menus also appear bluish.

Blue Enable Options
ON
OFF

This is used for making proper color and tint adjustments.

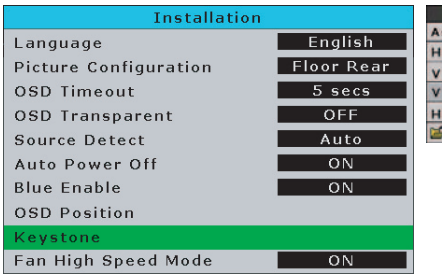


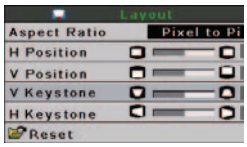
You can choose from four locations for settings menus to appear on the screen. Select from the top left, bottom left, top right, or bottom right areas of the screen.

OSD Position Options
Top Left
Bottom Left
Top Right
Bottom Right

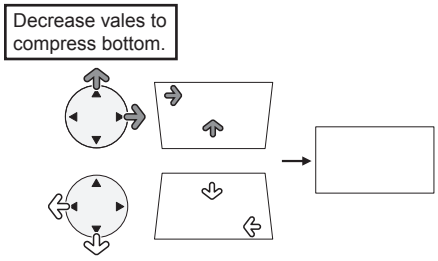
Keystone Correction ➤ When the image is projected either from top or from bottom toward the screen at an angle, the image becomes distorted in a trapezoidal shape. The function for correcting this distortion is called Keystone Correction.

1 Select Keystone. Adjustment slider bars appear to the right.
2 Press ◀ or ▶ to adjust the keystone correction items.

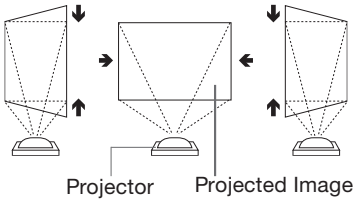


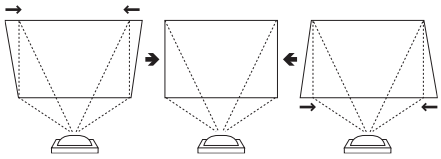


Selected item	Description
H Keystone	Adjusts horizontal keystone settings.
V Keystone	Adjusts vertical key-stone settings.
Reset	Restores original projections settings.



Horizontal Keystone Correction



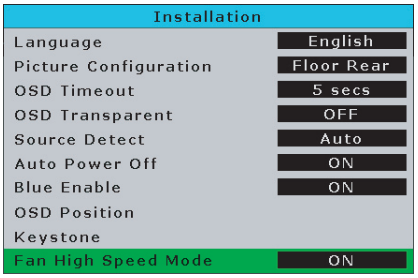


Vertical Keystone Correction

Note:

- Trapezoidal distortion of the image can be corrected up to an angle of approximately ±15 degrees. The actual screen can be diagonally set up to that angle as well.
- Straight lines or the edges of images may appear jagged while adjusting the image.
- Keystone correction does not work with the 1080I input signal.

Fan High Speed Mode ➤



If the projector is being used in a high-altitude environment, use fan high speed mode to keep the projector from overheating.

Set to ON to run the fan at high speed.

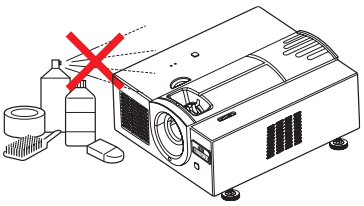
Set to OFF to run the fan at normal speed.

Fan High Speed Mode Options
ON
OFF

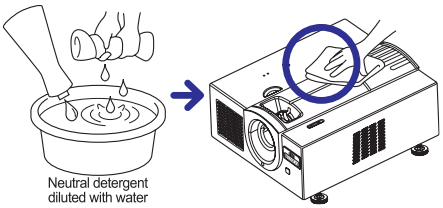
Appendix

Cleaning the Projector

- Unplug the power cord before cleaning the projector.
- Avoid using benzene or thinner, as these can damage the finish on the projector exterior.
- Do not use volatile agents, such as insecticides, on the projector.
- Do not leave rubber or plastic objects in contact with the projector for long periods as they may damage the finish of the projector.

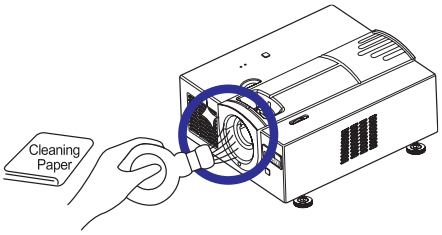


- Wipe off dirt gently with a soft flannel cloth.
- For hard-to-remove dirt, soak a cloth in a neutral detergent diluted with water, wring the cloth well and then wipe the projector.
- Strong cleaning detergents may discolor, warp or damage the coating on the projector. Make sure to test on a small, inconspicuous area on the projector before using.



Cleaning the Lens

- Use a commercially available blower or lens cleaning paper (for glasses and camera lenses) for cleaning the lens. Do not use any liquid cleaning agents, as they may wear the coating film on the surface of the lens.



- The surface of the lens is easily damaged. Do not scrape or hit the lens.

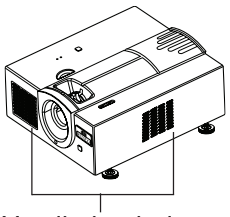
This projector is equipped with ventilation holes to ensure optimal operating temperature.

- Periodically clean the ventilation holes by vacuuming it with a vacuum cleaner.
- The ventilation holes should be cleaned after every 100 hours of use. Clean the ventilation holes more often when the projector is used in a dirty or smoky location.

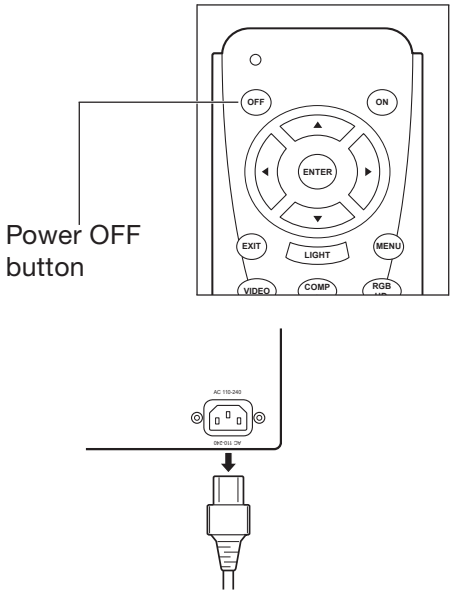
To clean the ventilation holes using a vacuum:

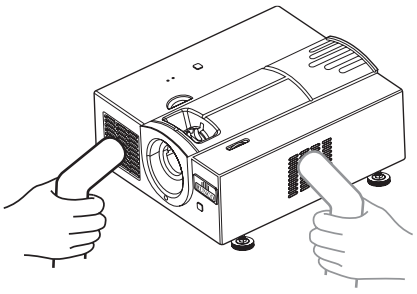
1 Press OFF on the remote control to turn off the power. Wait until the cooling fan stops.
2 Unplug the power cord.
3 Remove dust by placing the cleaner hose on the intake and exhaust ventilation holes.

Side and front view



Ventilation holes





◄ Lamp Maintenance

The projector lamp has a life of 2000 hours. Maintain proper ventilation to keep the lamp operating throughout its lifetime. Do not subject the projector to unnecessary vibration.

- Lamp replacement is recommended after approximately 2,000 cumulative hours of use or when you notice a significant deterioration in the picture and color quality. The number of hours the lamp has been used can be checked in the Information: Lamp Timer item in the Image Options menu.
- For lamp replacement, please consult your nearest Runco authorized service center or Runco dealer.
- The actual lamp service life may be less than 2000 hours depending on the environment in which the projector is used.

◄ Lamp Cautions

- This projector uses a pressurized mercury lamp. A loud sound may indicate lamp failure. Lamp failure is caused by excessive shock, improper cooling, surface scratches or deterioration of the lamp due to usage. The period of time up to failure largely varies depending on the individual lamp and the condition and the frequency of use. It is important to note that failure can often result in the bulb cracking.
- When the lamp replacement indicator and on-screen display icon are illuminated or are flashing, replacing the lamp with a new one immediately is recommended, even if the lamp appears to be operating normally.
- If the lamp breaks, glass particles may spread inside the lamp cage or gas contained in the lamp may be vented into the room from the exhaust vent. As the gas in this lamp contains mercury, ventilate the room well if the lamp breaks and avoid all exposure to the released gas. In case of exposure to the gas, consult a doctor as soon as possible.
- If the lamp breaks, there is also a possibility that glass particles may spread inside the projector.

  If this happens, contact your nearest Authorized Dealer to remove the damaged lamp and ensure safe operation.

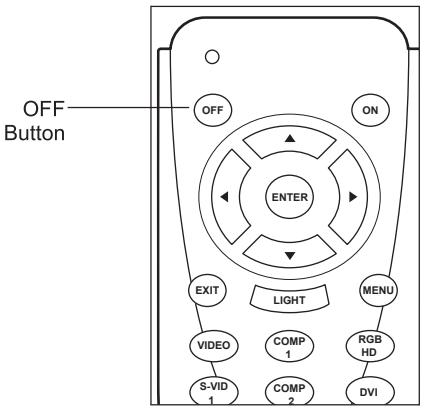
◄ Replacing the Lamp

CAUTION: Do not remove the lamp unit immediately after turning off the projector. Touching a hot lamp can lead to burns or injury. Wait at least one hour after the power cord is disconnected to allow the surface of the lamp unit to fully cool before removing.

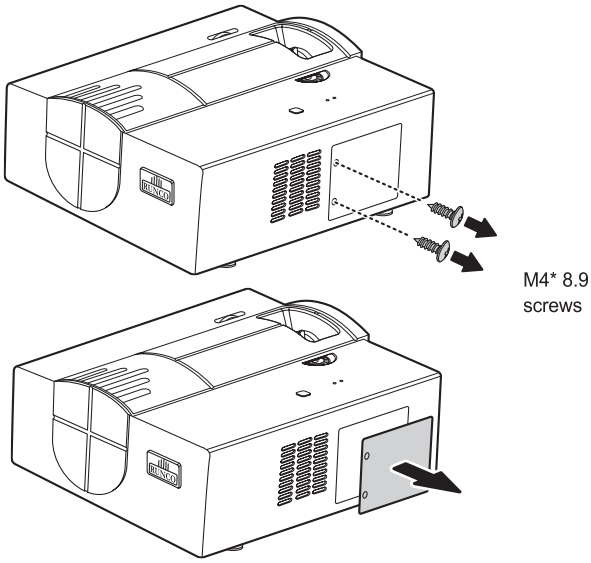
Removing and Installing ➤ the Lamp

Note:

- Allow the lamp to cool before removing. Do not touch the glass surface of the lamp or the inside of the projector when hot.
- To avoid injuring yourself or damaging the lamp, carefully follow the steps below.
- Do not loosen other screws except for the lamp cover.

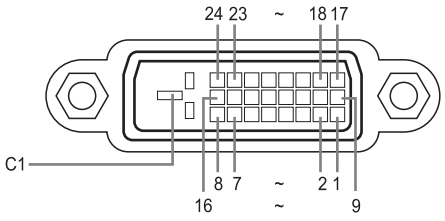


1. If the projector is running, press OFF on the remote control to turn off the power. Wait until the cooling fan stops.
2. Disconnect the power cord and wait at least an hour for the lamp to cool.
3. Remove the lamp cover.To remove, loosen the screws that secure the lamp unit cover. Then open the cover.
4. Insert the new lamp.
5. Replace the lamp cover. Tighten the screws.If the lamp and lamp cover are not correctly installed, the power will not turn on, even if the power cord is connected to the projector.



Connecting Pin Assignments

DVI-D port: 25 pin connector



• DVI Digital INPUT

Pin No.	Signal	Pin No.	Signal
1	T.M.D.S data 2-	14	+5V power from graphic card
2	T.M.D.S data 2+		
3	T.M.D.S data 2 shield	15	Ground
4	Not connected	16	Hot plug detection
5	Not connected	17	T.M.D.S data 0-
6	DDC clock	18	T.M.D.S data 0+
7	DDC data	19	T.M.D.S data 0 shield
8	Not connected	20	Not connected
9	T.M.D.S data 1-	21	Not connected
10	T.M.D.S data 1+	22	T.M.D.S clock shield
11	T.M.D.S data 1 shield	23	T.M.D.S clock+
12	Not connected	24	T.M.D.S clock-
13	Not connected	C1	Ground

Computer Compatibility Chart

When the projector is used with a computer, the following features are supported:

- Multiple signal support
- Horizontal Frequency: 25–75 kHz, Vertical Frequency: 50–85 Hz, Pixel Clock: 25–108 MHz
- Compatible with sync on green and composite sync signals
- XGA compatible with advanced intelligent compression. The following is a list of modes that conform to VESA. However, this projector also supports other signals that are not VESA standards.

PC/ MAC/ WS	Resolution		Horizontal Frequency (kHz)	Vertical Frequency (Hz)	VESA Standard	DVI Support	Display
PC	VGA	640 x 350	27.0	60			Upscale
			31.5	70			
			37.9	85	✓		
		720 x 350	27.0	60			
			31.5	70			
		640 x 400	27.0	60		✓	
			31.5	70		✓	
			37.9	85	✓	✓	
		720 x 400	27.0	60		✓	
			31.5	70		✓	
			37.9	85	✓	✓	
		640 x 480	26.2	50		✓	
			31.5	60		✓	
			36.8	70		✓	
			37.9	72	✓	✓	
			37.5	75	✓	✓	
			43.3	85	✓	✓	
			47.9	90		✓	
			53.0	100		✓	

✓ = Supported **AR =** Adjustment Required

PC/ MAC/ WS	Resolution		Horizontal Frequency (kHz)	Vertical Frequency (Hz)	VESA Standard	DVI Support	Display
PC	SVGA	800 x 600	31.4	50		✓	Upscale
			35.1	56	✓	✓	
			37.9	60	✓	✓	
			44.5	70		✓	
			48.1	72	✓	✓	
			46.9	75	✓	✓	
			53.7	85	✓	✓	
			56.8	90		✓	
			64.0	100		✓	
	XGA	1024 x 768	35.5	43		✓	True
			40.3	50		✓	
			48.4	60	✓	✓	
			56.5	70	✓	✓	
			60.0	75	✓	✓	
			68.7	85	✓	✓	
			73.5	90		✓	
			77.2	96			
			80.6	100			
MAC 13”	VGA	640 x 480	34.9	67			Upscale
MAC 16”	SVGA	832 x 624	49.6	75			
MAC 19”	XGA	1024 x 768	48.4	60	✓		True

✓ = Supported **AR =** Adjustment Required

Note:

- This projector may not be able to display images from notebook computers in simultaneous (CRT/LCD) mode. Should this occur, turn off the LCD display on the notebook computer and set display data output to “CRT only” mode. Details on how to change display modes can be found in your notebook computer’s user manual.
- When this projector receives 640 × 350 VESA format VGA signals, “640 × 400” appears on the screen.
- When projecting video images of an interlaced video signal, the intended image may not be projected when using RGB input, depending on the video signal. If the image is not projected, use the component 1 or 2 inputs, S-video input or video input.

Compatibility Chart

Component 1/2 support signal formats are Y/Pb/Pr, Y/Cb/Cr

VGA port support signal formats are RGsyncB, RGBHV or RGBCsysc

Resolution			H-Freq (kHz)	V-Freq (Hz)	Comp1 Support	Comp2 Support	S-Video Support	Composite Support	VGA Support	DVI Support
SD Video	NTSC	640x 480i	15.73	59.94/60	✓	✓	✓	✓		
	PAL	768 x 576i	15.63	50	✓	✓	✓	✓		
	SECAM	768 x 576i	15.63	50	✓	✓	✓	✓		
	NTSC-4.43				AR	AR	AR	AR		
	PAL-M				AR	AR	AR	AR		
	PAL-N				AR	AR	AR	AR		
	NTSC-J				AR	AR	AR	AR		
	PAL-60				AR	AR	AR	AR		
	NTSC-50									
ED TV	480p	720 x 480p	31.5	59.94/60	✓	✓			✓	✓
	576p	720 x 576p	31.3	50	✓	✓			✓	✓
HD TV	1080i/50	1920 x 1080i	33.8	50	✓	✓			✓	✓
	1080i/60	1920 x 1080i	28.1	59.94/60	✓	✓			✓	✓
	720p/50	1280 x 720p	37.5	50	✓	✓			✓	✓
	720p/60	1280 x 720p	45.0	59.94/60	✓	✓			✓	✓
HTPC	720p/48	1280 x 720p		48					✓	
	720p/75	1280 x 720p		75					✓	
	576p/48	1024 x 576p		48					✓	

✓ = Supported **AR =** Adjustment Required

DTV

Signal	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	DVI Support
480i	15.8	60	
480p	31.5	60	✓
576i	15.6	50	
576p	31.3	50	✓
720p	45.0	60	✓
720p	37.5	50	✓
1080i	33.8	60	✓
1080i	28.1	50	✓

✓ = Supported **AR =** Adjustment Required

RS-232

Pin Configuration:

Pin 2: TxD
Pin 3: RxD
Pin 5: Ground

Communication:

Baud Rate: 9600
Bits: 8
Parity: None
Stop bits: 1

All commands are in ASCII format.

When the projector receives a valid code, it will reply with the first three letters of the command followed by OK (example: If code RRA00 is sent, the projector will reply with RRAOK). If the projector receives a non-valid command, no reply will be sent.

COMMAND	DESCRIPTION	REPLY
RRA00	Saves current settings to the CUSTOM 1 memory*	RRAOK
RRA01	Saves current settings to the ISF Day memory*	RRAOK
RRA02	Saves current settings to the ISF Night memory*	RRAOK
RRB00	Recalls the Custom 1 memory settings	RRBOK
RRB01	Recalls the ISF Day memory settings	RRBOK
RRB02	Recalls the ISF Night settings	RRBOK
RRC00	Selects the S-VIDEO input	RRCOK
RRC01	Selects the COMPOSITE VIDEO input	RRCOK
RRC02	Selects the COMPONENT 1 input	RRCOK
RRC03	Selects the COMPONENT 2 input	RRCOK
RRC04	Selects the DVI input	RRCOK
RRC05	Selects the RGB input	RRCOK
RRD00	Selects the ANAMORPHIC (16:9) aspect ratio	RRDOK
RRD01	Selects the STANDARD (4:3) aspect ratio	RRDOK
RRD02	Selects the LETTERBOX aspect ratio	RRDOK
RRD03	Selects the VIRTUALWIDE aspect ratio	RRDOK
RRD04	Selects the CINEMA (2.35:1) aspect ratio	RRDOK
RRD05	Selects the VIRTUAL CINEMA aspect ratio	RRDOK
RRE00	Turns the projector OFF	RREOK
PON	Turns the projector ON	Random**

***Note:** All image quality settings must be made with the remote control. Once the image adjustments are complete, these commands will allow the settings to be stored in the selected memory.

****Note:** The power on command (PON) will not provide an OK reply, it will instead reply with a random character. For your automation system, simply ensure that you receive a character after the PON command. If you do not get any reply after PON, send PON again.

Troubleshooting

If the projector does not appear to be operating properly, note the symptoms present and use the following guide to assist you. If you cannot resolve the problems yourself, contact your dealer for assistance.

Note: *A **qualified Runco service technician** is required when opening the projector to diagnose any "probable cause".*

SYMPTOM	POSSIBLE CAUSES OR SOLUTIONS
Problems with Projector Unit	
Projector does not turn on	Projector power cord is not plugged into the wall outlet.
	Remote control batteries have run out.
There is no picture	The selected input mode is wrong.
	Cables are incorrectly connected to the rear panel of the projector.
	Power to the external connected device is off.
	The video signal format of the video equipment is incorrectly set.
Problems with the Image Quality	
Color is faded	Picture adjustments are incorrectly set.
Picture is blurred	Focus needs to be adjusted.
	The projection distance exceeds the focus range.
Picture noise appears (computer input only)	Auto Tune adjustment. See "HD/RGB Adjust" on page 38.
	Perform Clock adjustment. See "HD/RGB Adjust" on page 38.
	Perform Phase adjustments. See "HD/RGB Adjust" on page 38.
Picture is green with Component 1 or 2 input	Change the input signal type of the video equipment.
Picture is too dark	Picture adjustments are incorrectly set.
Picture is too bright	Picture adjustments are incorrectly set.

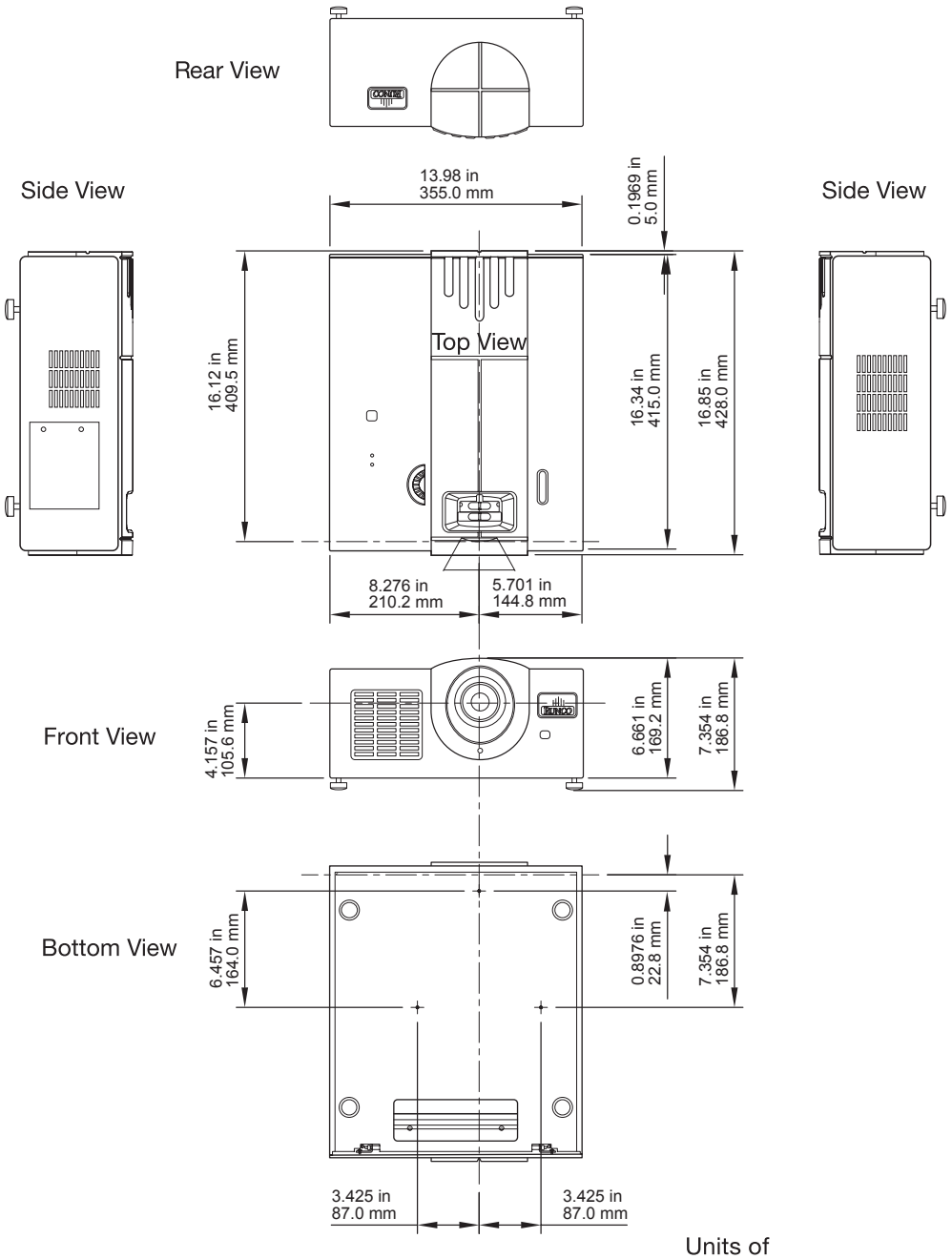
Specifications

Projector Type:	Digital Light Processing™ (DLP™), Single-Chip DMD™
Native Resolution:	1024 x 576
Aspect Ratios:	4:3, Letterbox, 16:9 Anamorphic, VirtualWide™, Cinema, Virtual Cinema™
Video Standards:	NTSC, PAL
DTV Compatibility:	480p, 720p, 1080i
Picture Size: (16:9 screens)	Recommended Width: Minimum: 72 inches (1.83 meters) Maximum: 150 inches (3.81 meters)
Throw Distance: (Factor x Screen Width)	Minimum: Screen Width x 1.37 Maximum: Screen Width x 1.67
Horizontal and Vertical Offset:	Horizontal shift: ± 10% Vertical shift: ± 50%
Brightness and Contrast:	**Cinema Standards Management System (CSMS) Specifications** - Brightness: 16 foot-Lamberts (fL) - Contrast Ratio: 221:1 These measurements are taken from the projector in a controlled, home theater environment. All measurements are made to ANSI/NAPM IT7.228-1997 specifications using the Photo Research PR-650 SpectraColorimeter and Minolta LS-100 Luminance Meter, Video Essentials test DVD and a 1.3 gain, 72-inch wide screen. The projector is calibrated to a color temperature of 6,500°K and has a minimum of 150 hours of usage. The foot-Lambert (fL) is the unit of measurement used in commercial movie theaters to express image brightness at the screen surface. The Society of Motion Picture and Television Engineers (SMPTE) specifies 16 fL as the target image brightness for film-based projectors using an open gate (without film in the projector). More importantly, today SMPTE specifies 12 fL as the target image brightness in Digital Cinema theaters. The foot-Lambert measurement is dependent on screen size, screen gain and projector light output. **Home Theater Calibration Specifications** - Light Output: 412 ANSI Lumens - Contrast Ratio: (tbd) **Industry-Standard Specifications** - Light Output: 800 ANSI Lumens - Contrast Ratio: 2500:1 These are typical projector brightness and contrast specifications found in most companies' sales literature. Runco includes these measurements in its literature to allow for direct comparison with other manufacturers' projectors. These measurements are typically taken at 9,000°K to 13,000°K to get expected performance data when the projector is used in professional, commercial and industrial displays.

Lamp:	250W NSH
Lamp Life:	2000 hours
Inputs:	(1) Composite Video, (1) S-Video, (2) RCA Component Video, (1) DVI w/HDCP, (1) VGA, (1) RS-232
Power Requirements:	100-240V AC, 50/60Hz, 370W
Operating Environments:	40º to 95ºF (5º to 35ºC); 20-80% humidity (non-condensing)
Dimensions: **(w/out feet)**	Width: 14 in. (356 mm) Depth: 16 3/8 in. (416 mm) Height: 6 2/3 in. (169 mm)
Weight:	Net: 25 lbs. (11.34 kg)
Regulatory Approvals:	Complies with FCC Class B, CE, C-Tick
Limited Warranty:	Projector: (2) Two years parts and labor from the date of delivery to the end user. Lamp Warranty: 1000 hours or (6) Six months, which ever comes first.

Specifications are subject to change without notice.

Dimensions



Units of measurement:

inches and mm

SERIAL NUMBER

RUMA-011100
rev 7-13-05

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